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ABSTRACT

By 1976-77 almost four million teachers and other school personnel belonged to teacher retirement systems or public employee retirement systems. To help laypersons better understand these systems, this report describes the institutional characteristics of public pension funds whose members include teachers and explains the concepts behind such public retirement systems. Data are drawn from U.S. government sources, the National Education Association, and a survey of public pension funds in 49 states and 7 municipalities. The report first describes the number, size, and eligibility criteria of teacher retirement systems. It then discusses the funds' benefits (including income and insurance plans), the "vesting" in employees' names of their rights to their pensions, and the relationships of pensions to other post-retirement income. Following a review of the methods of funding pensions and of calculating each fund's pension obligations, the authors examine the systems' administrative structures and the fiduciary responsibilities of fund administrators. (Author/RW)

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A RAND NOTE

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THE CHARACTERISTICS OF TEACHER RETIREMENT SYSTEMS

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PREFACE

This Note was produced under a research contract from the National Institute for Education, U.S. Department of Health, Education, and Welfare. The Note describes the institutional characteristics of teacher retirement systems and offers simplified explanations of the concepts involved in public pension funding. It therefore serves as a background companion volume to the Rand report issuing from the study, R-2317-NIE, *The Financial Condition of Teacher Retirement Systems*, by Richard B. Victor (forthcoming).

The authors express their appreciation to Iao Kata[illegible], who reviewed the manuscript, and especially to Ruth Mitchell for her patience and valuable suggestions during the early versions of this Note.

SUMMARY

Recent concern about the potential financial problems of public employee retirement systems, including teacher retirement systems (TRSs), has triggered considerable research interest in the area of public pension funding. Lay readers, however, often find the resulting research reports technically complex and confusing. It is the purpose of this Note to acquaint the reader with the institutional characteristics of TRSs and offer simplified explanations of the concepts involved in public pension funding.

Data from the Census Bureau, the Congressional Pension Task Force, the National Education Association, and from our sample of TRS reports[1] show that TRSs vary widely in their benefits, funding and financing schemes, and administration. *There is no typical teacher retirement system.* However, some general statements about TRSs may be made.

TEACHER RETIREMENT SYSTEM COVERAGE AND MEMBERSHIP

In 1976-77, almost 4 million teachers and other school employees belonged to one of the 50 statewide or 17 local public employee retirement systems which include teachers in their membership. These systems range in size from one or two thousand to several hundred thousand members and may include other classes of employees besides teachers. Only about half of the 67 systems restrict their membership to professional teachers and administrators. In 17 systems, both professional and nonprofessional school employees (e.g., custodians, bus drivers) are eligible for membership and the remaining retirement systems offer

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[1] U.S. Department of Commerce, Bureau of the Census, *Employee Retirement Systems of State and Local Governments*, Vol. 6, No. 1, Washington, D.C., September 1978; U.S. House of Representatives, Committee on Education and Labor, *Pension Task Force Report on Public Employee Retirement Systems*, 95th Cong., 2d sess., Washington, D.C., March 15, 1978; National Education Association, *Teacher Retirement Systems*, 1976. For a description of the TRS reports, see App. A.

general coverage for all state and local public employees. In addition, depending on the system, other groups such as vocational school and community college instructors may belong. Membership is usually compulsory for all eligible full-time employees.

TEACHER RETIREMENT SYSTEM BENEFITS

In general, teachers are eligible to begin receiving retirement benefits when they attain the specified normal retirement age which varies between age 55 and 65. However, most systems allow earlier retirement if an employee either completes the service requirement or accepts lower retirement benefits. For example, a Georgia teacher may retire with full benefits at the age of 62 or at any age after completing 30 years of service. However, he or she may retire "early" at age 60 with ten years teaching service, but will receive reduced benefits.[1] In most cases, a teacher need not work continuously until retirement in order to receive retirement benefits. Upon completion of a minimum service requirement, usually five to ten years, a teacher is "vested" and will begin to receive benefits at the normal retirement age, regardless of his or her employment status.

Although a TRS may offer a variety of benefits packages and programs, the most common benefit is the retirement income allowance. In most TRSs, the size of the allowance is calculated using a unit benefit formula which relates three elements to determine the amount of the benefit a retiree may receive. They are:

- *Salary base*, which is usually the teacher's average annual salary figured over the final three or five years of his or her career.
- *Service credits*, which generally represent the number of years of teaching.
- *Multiplier*, usually ranging from 1.5 percent to 2.5 percent, which determines what percentage of the salary base a retiree will receive for each service credit.

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[1] Teachers' Retirement System of Georgia, *TRS Facts*, Atlanta, Georgia, July 1, 1977, p. 4.

The general unit benefit formula is:

salary base x service credits x multiplier = allowance.

For example, a California teacher who retires after 25 years of service with a salary base of $15,000 would receive:

$15,000 x 25(yr) x 2% = $7,500 annual allowance.[1]

Retirement allowances vary considerably, depending on how the benefit formula used by a particular system relates these three elements. For example, the Illinois formula multiplier increases for each decade of service, so that a teacher earns more retirement benefits in the later years of his or her career.[2]

As we stated above, early retirement results in the actuarial reduction of the retirement income allowance to account for the longer retirement period. About half the TRSs determine early retirement benefits based on an actuarial table. Other systems use a modified benefit formula to calculate the reduced benefits. Louisiana, for example, reduces the multiplier in the formula from 2.5 percent to 2.0 percent when figuring early retirement allowances.[3] Many other systems reduce the normal allowance by 6 percent for every year under the normal retirement age.

The retirement income allowance may be increased in a variety of ways, depending upon the provisions of the specific system. First, most systems allow teachers to "purchase" additional service credits. The majority of TRSs allow teachers to purchase credits for years of out-of-state teaching. However, a few systems permit members to buy credits for such activities as private school teaching, sabbatic leaves, and certain types of child care. In order to purchase service credits,

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[1]The State Teachers' Retirement System of California, *Service Retirement*, Sacramento, California, September 1977.

[2]Teachers' Retirement System of the State of Illinois, *Retirement*, Springfield, Illinois, 1977.

[3]*Teachers' Retirement System of Louisiana*, Baton Rouge, Louisiana, 1978.

or she would have made to the system during those years of service. In about a quarter of TRSs, a member may increase retirement income by making additional voluntary contributions during the teaching career. Finally, 95 percent of TRSs have some form of post-retirement allowance adjustments. These adjustments, which are intended to help benefits keep up with the rising cost of living, may be awarded in three ways:

- *Automatic adjustments.* About 20 percent of TRSs annually increase allowances by a specified percentage, usually 2 to 3 percent.
- *Variable adjustments.* In a quarter of the systems, adjustments of 3 to 5 percent are awarded based on a triggering mechanism, such as an increase in the Consumer Price Index.
- *Ad hoc adjustments.* The remainder of TRS adjust allowances periodically, but not regularly. Ad hoc increases tend to be higher but less frequent than the other adjustments.

Nearly two-thirds of TRSs offer Social Security coverage, and in most cases all TRS benefits are entirely supplemental to those received through Social Security. In addition, most retirement allowances are not affected by any amount of post-retirement work or earnings as long as the employment is not covered by the retiree's pension system.

In addition to the retirement income allowance, many TRSs offer a variety of other benefits and programs, such as:

- Survivor's benefits;
- Disability benefits;
- Death benefits;
- Group life insurance;
- Post-retirement health insurance; and
- Programs of tax-sheltered annuities.

FUNDING AND FINANCING TEACHER RETIREMENT SYSTEMS

Retirement benefits may be regarded as long-term obligations incurred on behalf of the employee. A TRS meets these obligations by first adopting a funding plan which schedules monetary payments to be made over a period of time to amortize the debt. The system then finances those payments by collecting contributions from the state,

the school district, and/or the employee. The funding and financing of TRS benefits is a complicated and technically complex area. In this section, we will present a simplistic overview of the funding and financing process. For a more complete explanation of funding concepts and factors, we refer the reader to Sec. IV of this Note.

Funding

A TRS may adopt two different approaches to funding its benefit obligation. It may choose to pay for the benefits as they become due; that is, after a member's retirement. If it does, the TRS will adopt current disbursement funding, in which the system contributes only enough each year to cover its current benefit payments and administrative costs. Pay-as-you-go funding, as it is also known, has the advantages of low start-up costs and uncomplicated administration. However, it accumulates no fund reserves for emergencies and can result in ever-increasing benefit costs.

On the other hand, a TRS may decide to pay for the benefits during the employee's career and, therefore, accumulate a pool of funds from which the benefits will be paid. This is called actuarial reserve funding. For simplicity's sake, it may be useful to think of a benefit obligation as a mortgage on a house. In order to pay off the debt, one must first determine how large the debt is and then determine how much must be paid each year to amortize the debt in the specified number of years (in this case, the member's career length).

All TRSs we observed used the projected cost method, which calculates benefit costs based on the benefits members are *likely* to earn during their careers. The actuary uses the benefits promised by the system, an inventory of the number and characteristics of the membership, and a series of actuarial assumptions regarding future events (e.g., mortality rates, salary increases) to predict:

- The probability that an employee will qualify for a pension.
- The length of the retirement period over which the annuity must be paid.

o The dollar amount of the annuity.

With these predictions, the actuary can estimate the present value of the total obligations of the system.

Once the total obligations are calculated, a funding method (such as the Entry Age Normal and Aggregate methods) is used to systematically distribute the costs over a specified period of time. The funding method assigns a portion of the benefit debt to each year. This annual "mortgage" payment is called the *normal cost*. The normal cost is typically expressed as a level percentage of the system's payroll and it may fluctuate from year to year.

Theoretically, if a system continues to contribute the normal cost each year, it will collect enough funds to pay its benefit debt when its members begin to retire. However, actuarial assumptions are often difficult to estimate accurately, and the cost calculations must be continually updated with changing market conditions and benefit improvements. If the cost calculations are inaccurate or the system does not pay the full normal cost, a supplemental liability, or unfunded liability, is created. A system may correct this funding shortfall by making additional payments, again like a mortgage. If it does not finance the liability, it may threaten the integrity and security of the TRS.

Financing

Once the normal cost is determined, the system must adopt a financial scheme for collecting the needed contributions. It should be remembered that the financial payments may not necessarily follow the funding plan. In fact, we found that the funds contributed to a system tend not to coincide with the levels recommended by the funding plan.

In all but a few TRSs, employees must finance a portion of their retirement benefits by making mandatory contributions to the system. Employee contributions are generally set by statute and average between 5 and 6 percent of a teacher's salary, although the contribution can range from 3 to 10 percent of salary.

The employer's portion of the annual benefit cost may be paid by the state, the school district or, in a few instances, by both. The employer's contribution may be determined:

- o *By statute.* The amount is expressed as a constant percentage, and generally ranges between 6 and 9 percent of payroll.
- o *By an annual actuarial valuation.* About 40 percent of TRSs use this scheme, which results in a contribution that often fluctuates from year to year. These contribution levels average 12 to 14 percent per year.
- o *By special legislative appropriations.*

THE ADMINISTRATION OF TEACHER RETIREMENT SYSTEMS

The administrative operation of a TRS, like a system's benefit package, may be unique to each system and, therefore, difficult to generalize. However, we outline below the most common administrative structure used by TRSs.

At the top of the administrative structure is the *board of trustees*, which is, in most cases, responsible for all policy, budgetary, and investment decisions. The degree of influence and control exercised by a board is difficult to ascertain, but probably ranges from dominant participation in system operations to rubberstamp approval, depending upon the system itself. A board of trustees generally includes five to 14 members and may be composed of:

- o One or more state or local officials serving ex officio.
- o Active or retired members of the system, either elected to the Board by the system membership or appointed by a state or local official.
- o A number of outside experts, including doctors, lawyers, bankers, investment counselors, etc., appointed to the board by the chairman or a state or local official.
- o Members of the community, also appointed to the board.

The *system director* directs the day-to-day operations of the system. A TRS may also employ an array of consultants and technical advisors, such as auditors, accountants, and actuaries.

Although the administrative functions performed by a TRS probably reflect the benefit package and funding plan of each individual system, several administrative functions are generally regarded as essential to the operation of a TRS:

- *The investment of system assets.* While the board of trustees may have the formal responsibility for investment decisions, this task may actually be handled by an outside investment firm, an in-house investment staff or, in some systems, by a centralized state investment council.
- *Communication and disclosure.* All TRSs provide their members with a copy of the retirement system benefits and provisions and with an annual statement of the members' contributions and accrued benefits. These are provided by the staff either automatically or upon request by the member.
- *Audits and actuarial valuations.* By law, all TRSs must be regularly audited and, in most systems, audits are performed annually. In addition, all TRSs by law must perform periodic actuarial valuations; however, these are conducted less frequently than audits. Most TRSs perform complete valuations every two to five years.

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I. INTRODUCTION

Government officials at all levels have long been concerned about the financial practices of state and local government retirement systems, including teacher retirement systems (TRS). In 1916, the New York City Commission of Pensions cited the "lack of knowledge of the extent of future obligations and oblique methods of financing fund requirements" as disturbing features of the city's retirement systems.[1] This concern was echoed by the General Accounting Office 63 years later when it stated that "[M]any State and local government pension plans are not funded on a sound actuarial basis because they are not setting aside sufficient funds to provide for estimated future benefits."[2] This concern may be well-advised since the financial problems of teacher retirement systems (TRS) could have widespread effects. First, the retirement security of 4 million teachers and school administrators depends on the financial integrity of TRS. In addition, poor financial planning by TRS could result in rising pension costs putting an increasingly heavy burden on states, municipalities, and individual school districts. Finally, the nation's capital markets, in which public pension funds are investors, could be disturbed.

Such concerns have triggered considerable interest in public retirement systems. Research is underway at the Rand Corporation and at the Urban Institute to assess the extent and implications of the financial condition of retirement systems and to evaluate possible reform measures. In addition, federal and state governments have commissioned studies of their public retirement systems.[3] However, lay readers often find

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[1] Commission on Pensions, City of New York, *Report on the Pension Funds of the City of New York*, New York, 1916.

[2] U.S. General Accounting Office, *Funding of State and Local Government Pension Plans: A National Problem*, Washington, D.C., August 30, 1979.

[3] For example, *Report of the Illinois Public Employees Pension Laws Commission*, 1975-1977; Legislative Research Commission, *An Analysis of Retirement and Benefit Plans for Kentucky State Employees*, Research Report No. 128, Frankfort, Kentucky, October 1975; U.S. House of Representatives, Committee on Education and Labor, *Pension Task Force Report on Public Employee Retirement Systems*, 95th Congress, 2nd Session, March 15, 1978.

these reports difficult to follow for several reasons. First, many of the concepts involved in pension funding are technically complex. Also, these reports are often laden with jargon. A reader may be confronted with terms like "actuarial assumptions," "unfunded liability," or "normal cost." Finally, public retirement systems, including TRS, are so diverse that generalizations are often difficult to make.

In order to better understand the financial problems of TRS, it is important to have some familiarity with these institutions and the actuary's vocabulary. This paper presents a description of the institutional characteristics and financial practices of TRS as well as simple explanations of certain technical concepts necessary to grasp discussions of TRS financial condition. This paper is intended as a companion volume to R-2517-NIE, *The Financial Condition of Teacher Retirement Systems*, by Richard B. Victor. However, since many of the concepts discussed in this paper are applicable to other types of public retirement systems, it may be useful as a general introduction to the structure and financing of public retirement systems.[1]

OUTLINE OF THE STUDY

Section II introduces teacher retirement systems: their number, size, and membership. Section III describes the types of benefits offered by teacher retirement systems, outlines how benefits are calculated, and gives examples of the substantial variation in benefits between different systems. Section IV discusses the most important and the most complex aspect of TRS: the funding and financing of retirement benefits. During this discussion, we provide simplified explanations of basic funding concepts and review the actual funding and financing practices of TRS. Finally, Sec. V describes the administrative structure of teacher retirement systems.

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[1] For a more complete discussion of these concepts, we recommend a comprehensive technical text such as C. L. Trowbridge and C. E. Farr, *The Theory and Practice of Pension Funding*, Richard D. Irwin, Inc., Homewood, Illinois, 1976; and Dan M. McGill, *Fundamentals of Private Pensions*, Richard D. Irwin, Inc., Homewood, Illinois, 1977.

DATA SOURCES

The data used in this paper came from a variety of sources. The reader should remember that each data source uses different samples of retirement systems. As we describe in Sec. II, there are many different kinds of teacher retirement systems. Teacher retirement systems may range in coverage from "general coverage" plans which include all public employees in their membership to "teacher only" systems which cover only teachers and other professional school employees. Further, a retirement system may be statewide or it may be a local system which includes members from a single city. The data sources are reviewed below along with a brief description of the sample of retirement systems each source uses.

The *Pension Task Force Report* (PTF) is one of the most complete surveys of all public retirement systems.[1] As the reader will see throughout this paper, the Task Force provided data on many aspects of TRS, particularly benefits. However, most of its data are presented in groupings such as "state government systems," and "teacher systems," so it is impossible to segregate the data on the state government systems that include teachers from those that exclude teachers. Unless specifically stated otherwise in the text, the Pension Task Force sample included the teacher systems only, supplemented by information from the TRS Reports described below.

The *Census Bureau* (CB) sample, from the 1977 Census of Governments,[2] includes all active retirement systems. We use this for financial (assets, benefit payments, revenues by source) and membership data only.

The *National Education Association* (NEA) summarizes the 1975 legal requirements generally covering benefits and administration for 54 of the 67 state and local teacher retirement systems.[3]

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[1] U.S. House of Representatives, Committee on Education and Labor, *Pension Task Force Report on Public Employee Retirement Systems*, 95th Congress, 2nd Session, Washington, D.C., March 15, 1978.

[2] U.S. Department of Commerce, *Employee Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, Washington, D.C., September 1978.

[3] National Education Association, *Teacher Retirement Systems*, 1976.

As part of this study, we collected a sample of *teacher retirement system* (TRS) reports. To do so, we relied on the cooperation of the retirement system officials. This sample, while not random, yields a fair representation of the universe of state teacher retirement systems.[1] We began the data collection in late February 1978, by sending letters to the TRS directors who are listed in the National Education Association report on teacher retirement systems. The letter requested three types of information: benefit and membership eligibility data, annual reports containing system financial data and actuarial valuations describing the financial condition of the system. Several weeks later, follow-up letters again requesting information were sent to the systems which failed to respond. A final request was made by telephone in May and June of 1978. Calls were made to those systems that had not responded to the two mail inquiries and to those systems not listed in the National Education Association report and, therefore, that had not received letters. Also, systems that sent only benefit information were called to request the financial and actuarial data. No further inquiries were made except when specific questions arose regarding individual systems. A list of specific reports and items included in the TRS reports is presented in Appendix A.

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[1]The TRS sample, however, does not include many local systems.

II. TEACHER RETIREMENT SYSTEM COVERAGE AND MEMBERSHIP

The Census Bureau estimates that in 1976-77, almost 4 million teachers and other school employees belonged to one of the 67 state or local public retirement systems that include teachers in their membership.[1] However, *there is no typical teacher retirement system.* A retirement system may be open to all public employees or membership may be limited to school employees. Some systems restrict their membership to only professional teachers and administrators. A TRS may be statewide or it may operate within a single city or school district. Finally, teacher retirement systems range in size from one or two thousand to several hundred thousand members. This chapter describes the major coverage and membership characteristics of the 67 teacher retirement systems.

COVERAGE

Retirement systems which include teachers are either general or limited in coverage. *General coverage* pension plans are open to teachers as well as other school employees, and state and/or local government employees. In *limited coverage* systems, membership is available only to one or more specific classes of employees. Although the eligibility requirements vary between systems, there are two types which concern teachers: limited coverage systems for several categories of school employees and limited coverage systems for teachers and professional school personnel only. Table II-1 below shows the distribution of teacher retirement systems based on coverage class, jurisdiction, and their aggregate membership.

Membership Eligibility in General Coverage Systems

In the context of this report, a "general coverage retirement system" may be broadly defined as any retirement system which extends membership

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[1] U.S. Department of Commerce, *Employee Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8.

Table II-1

NUMBER AND MEMBERSHIP OF RETIREMENT SYSTEMS COVERING TEACHERS BY COVERAGE CLASS

Type of Coverage	Number of State Systems	Number of Local Systems	Aggregate Membership (millions)
General	15	1	2.0 (850,000 school employees)
School employees	15	6	1.5
Teachers only	20	10	2.0
Total	50	17	5.5

SOURCE: U.S. Department of Commerce, *Employee-Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8.

to school employees as well as other classes, but not necessarily all classes, of state and local government employees. Many state systems, such as Hawaii, Florida, and Colorado[1] systems, cover all state and local employees. In general, membership is compulsory for those employees who are eligible.

General coverage systems may operate as a single integrated system or as a consolidation of several individual limited-coverage systems within a single administrative framework. The Hawaii Employee Retirement System, which includes all state and local government employees, offers a separate benefit package for the police and fire divisions, but maintains a single combined retirement fund with the revenues from the various employment divisions commingled. The Kansas Public Employee System operates three separate retirement systems within a single administrative framework.[2] Each of the three employee divisions (state

[1] The Colorado system excludes Denver school employees from membership. Employees' Retirement System of the State of Hawaii, *Fifty-first Annual Report*, Honolulu, Hawaii, June 1976; State of Florida Department of Administration, Division of Retirement, *Annual Report*, Tallahassee, Florida, 1977; the Public Employees' Retirement Association of Colorado, *1977 Statistical Supplement to the Annual Report*, Denver, Colorado, 1978.

[2] Kansas Public Employees Retirement System, *Sixteenth Annual Report, Fiscal Year 1977*, Topeka, Kansas, 1977.

employees, school employees, and the uniformed services) operate individually with separate plan provisions, benefit packages, and retirement funds. We treat those general coverage systems with separate benefit packages and financing as limited coverage systems.

Membership Eligibility in Limited-Coverage Systems for Teachers and Selected Categories of School Employees

In general, groups of professional and nonprofessional employees (e.g., custodians, bus drivers, lunchroom attendants) employed by the state or school district are eligible for membership in these systems. Membership is *compulsory* for all full-time employees in such systems except in the Nebraska and Oklahoma School Employee systems in which membership is voluntary for all nonprofessional employees.[1] In addition to providing coverage for elementary and secondary education employees, nearly all school employee systems also extend membership to include the faculty of state-supported community colleges. In some cases, college and university faculties are also eligible.[2]

Membership Eligibility in Limited Coverage Systems for Teachers Only

Membership in these systems include at least all instructional staff, and often administrators and supervisors within the school district, librarians, nurses, and any other "professional" employees as well.[3] All systems described in the National Education Association (1976) report also extend membership to administrative and supervisory officials (e.g., vice principals, state education agency officials, etc.) and to the resident faculty of community colleges. Some systems also include the faculty of state supported educational institutions. For example, the faculties of New York State vocational schools and

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[1] National Education Association, *Teacher Retirement Systems*, 1976.

[2] The Texas and West Virginia school systems offer community college faculty the option of enrolling in either the state system or in TIAA-CREF. National Education Association, Ibid.

[3] Exactly which categories of school employees are considered "professional" varies between systems. Nonprofessionals in school systems are usually eligible for a general coverage system or a separate school employee system.

reformatories are covered by the state teachers plan. Membership is usually compulsory.[1]

LEVEL OF ADMINISTRATION

Teacher retirement systems are created by state law as either a statewide system including multiple employers or as a local system which is operated and usually financed in close relation to a single employer --in this case, a single school district. Presently, there are 50 state-administered and 17 locally administered retirement systems which include teachers. Statewide systems covering multiple jurisdictions and several employers are all administered on the state level. However, they may be financed entirely by the state or individual school districts or some combination of state and local contributions. In our sample,[2] about 40 percent of statewide systems are financed entirely by the school districts and an equal number are financed entirely by state contributions. In the remaining systems, the financing is shared. For example, the districts pay 60 percent of the cost in the New Hampshire system with the state paying the balance; in Rhode Island, the state and local governments divided the cost equally.[3]

State and local systems which operate in the same state are usually mutually exclusive. For example, the teachers in Duluth, Minneapolis, and St. Paul are specifically excluded from membership in the Minnesota Teacher System and Chicago teachers may not join the Illinois system. Some systems allow a choice however. Des Moines, Iowa, teachers may choose between the local teacher system or the state general coverage system. Similarly, an Oregon teacher moving into the Portland, Oregon, system may retain his membership in the Oregon Public Employee system. And a teacher in Connecticut is eligible for membership in either the state teacher system or the state public employee system.[4]

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[1] National Education Association, *Teacher Retirement Systems*, 1976.

[2] See Appendix for a description of the Teacher Retirement System (TRS) Report sample.

[3] Ibid.

[4] All of the above provisions were in effect as of 1975. (National Education Association, *Teacher Retirement Systems*, 1976.)

SIZE

The size of teacher retirement systems may be described along several dimensions: the gross revenues, assets, number of members, etc. For simplicity, we describe these systems in terms of membership, which correlates well, though not necessarily perfectly, with the other measures of size. As public employee retirement systems go, teacher systems are quite large, varying in size from 1,000 to 375,000 members, although the typical system has 10,000 to 50,000 members.[1] System size is generally related to coverage class or level of administration, but this is not always true: local systems are not necessarily the smallest nor are statewide general coverage systems the largest. The Idaho general coverage state public employee system has a membership of only 47,000 members, while the New York City teacher system has an enrollment of 78,000 teachers; local systems range from memberships as small as 1,200 in the Des Moines and Duluth systems to the large New York City system.[2]

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[1] According to the standards of the Pension Task Force, nearly all teacher retirement systems are large. The Task Force classified a system as "large" if the membership numbered 1,000 or more.

[2] Membership data are obtained from the U.S. Department of Commerce, *Employee Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8.

III. TEACHER RETIREMENT SYSTEM BENEFITS

The diversity of teacher retirement systems is evident in the retirement benefit packages which are offered to system members. The range of benefits and programs and the different general formulas by which systems compute retirement allowances are virtually unique to each system. For example, the Iowa system offers a teacher a retirement allowance based on his years of Iowa teaching plus additional death and survivors' benefits. The New Jersey system, on the other hand, offers a retirement allowance based on out-of-state as well as in-state teaching and an automatic post-retirement cost of living increase. In addition, a New Jersey teacher is eligible for disability protection, group life insurance, death and survivors' benefits, tax-sheltered annuities and a program allowing current members to borrow from their retirement accounts. Therefore, in this section we will not attempt to sketch a "typical" benefit package. Instead, we will concentrate on the most common benefit--the retirement income allowance--and how the system eligibility provisions, benefit formulas, and a teacher's retirement decisions affect the retirement allowance received. We also will briefly describe the range of other benefits that may be available to a teacher through his retirement system.

RETIREMENT INCOME BENEFITS

Teacher systems offer an array of *normal*, *optional*, and *early* retirement benefit options so that an employee may choose the retirement age, career length, and level of benefits he prefers. Upon retirement, the employee receives either full benefits or actuarial reduced benefits. "Full benefits" are awarded for normal or optional retirements; reduced benefits are received by a retirant who elects the early retirement option.

Eligibility

Retirement system provisions which determine when a teacher is eligible for retirement and at what level of benefits are particularly

important to a teacher's career and retirement decisions. For example, consider a teacher in Michigan who is age 55 and has taught for 28 years. According to the Michigan system provisions, he is now eligible for *early* retirement at reduced benefits. Or if he continues teaching for two more years (30 years of service), he will then qualify for *optional* retirement which earns him an unreduced retirement allowance. Finally, he may decide to teach until the *normal* retirement age of 60. If he does, he will receive full benefits, as in optional retirement, but his allowance will be 10 percent larger since he will have earned three more years of teaching credit.[1] Table III-1 below illustrates the annual retirement allowance that the teacher would receive as a result of each of those retirement decisions.

Table III-1

POSSIBLE RETIREMENT ALLOWANCES

At:	Eligible for:	Annual Allowance of:
Age 55 w/28 years teaching	Early retirement	$4410
Age 57 w/30 years teaching	Optional retirement	$6750
Age 60 w/33 years teaching	Normal retirement	$7425

SOURCE: Department of Management and Budget, *Guidelines of the Michigan Public School Employees' Retirement System*, Lansing, Michigan, 1977.

These figures, based on an average salary of $15,000, tend to understate the differences between early, optional, and normal retirement. Presumably, the allowances for both optional and normal retirement would be even higher since a teacher is likely to receive salary increases during those additional years of teaching. Therefore, retirement eligibility provisions not only signal when a teacher qualifies for retirement, but also may affect the retirement income that he receives.

[1] For a more complete explanation of benefit computation, see *The Benefit Formula*, p. 21.

As illustrated in the above example, eligibility for retirement with full benefits is set by either age, service, or both.[1] It is most often determined by a stipulated combination of age and length of service. "Normal retirement" reflects the traditional notion of a specified "retirement age." Typically, its age requirement is higher than for either optional or early retirement, but normal retirement has significantly lower accompanying service requirements. Normal retirement age may vary from ages 50 to 65, with associated service requirements up to 30 years.[2] In our sample (TRS), 40 percent of the systems specify a normal retirement age of 55 to 65 with 5 to 10 years service; in half of the systems, an employee may retire at age 60 to 65 with as little as one year of service.[3] The Iowa system, with a normal retirement of 65 with an accompanying 30-year service requirement, has one of the highest eligibility standards,[4] while Hawaii teachers may retire with full benefits at age 55 and only 5 years of service.[5] More typical is the Rhode Island system which offers full retirement benefits when a teacher reaches age 60 with 10 years of service.[6]

Two-thirds of the systems in the TRS sample provide for optional retirement with full benefits.[7] Optional retirement is a reward for lengthy service rather than age, as is normal retirement. Consequently, optional retirement is available at earlier ages but with higher service

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[1] We discuss eligibility for early retirement and its reduced benefits separately.

[2] *Pension Task Force Report*, 1978, Table 25 supplemented by TRS reports.

[3] Teacher Retirement System (TRS) reports.

[4] Iowa Public Employees Retirement System, *Your IPERS Benefits*, Des Moines, Iowa, 1975.

[5] Employees' Retirement System of the State of Hawaii, *Fifty-first Annual Report*, Honolulu, Hawaii, 1976.

[6] Employees' Retirement System of the State of Rhode Island, *Annual Report of the Retirement Board*, Providence, Rhode Island, June 30, 1977.

[7] The Pension Task Force found that nearly 90 percent of teacher retirement systems (not including mixed coverage systems) had some form of optional retirement. However, this figure included 10 percent which offered optional retirement based on age alone. In our sample, we found no instances of "age only" optional retirement requirements (*Pension Task Force Report*, 1978, Table 25).

requirements than normal retirement. In Georgia, for example, normal retirement is available at age 62 with no minimum service requirement, while a Georgia teacher has the option of retiring with full benefits as early as age 50 if he has entered 30 years of service.[1] A Rhode Island teacher is given three retirement options with full benefits: he may retire at age 60 with 10 years of service (which is considered normal retirement), at age 55 with 30 years of service, or at any age with 35 years of service.[2]

Most systems offer early retirement possibilities at less than full benefits. The Pension Task Force found that 80 percent of teacher and school employee systems offer this early retirement option[3] with eligibility based on age only, service only, or a combination of age and service. A teacher in Vermont, for instance, qualifies for early retirement benefits at the age of 55 regardless of years of service; Rhode Island employees may retire with reduced benefits at any age after completing 30 years of teaching.[4] Most teachers, like the one in our illustration, qualify for early retirement only after reaching a specified age (in the case of Michigan, age 55) *and* completing minimum service requirements (15 years of service).[5] In exchange for early retirement, the employee must accept a reduced retirement income allowance. This reduction is derived from either actuarial calculations or a legislative decision (as in the example of Louisiana below) and is intended to adjust for the longer period over which the retiree can expect to receive the retirement allowance. For example, a Texas teacher who retires at the earliest age possible, age 55 with 20 years of service, would receive only 70 percent of the annual retirement benefit he would

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[1] Teachers' Retirement System of Georgia, *TRS Facts--A Member's Guide to the Teachers Retirement System of Georgia*, Atlanta, Georgia, 1977-78, p. 4.

[2] Employees' Retirement System of the State of Rhode Island, *Annual Report of the Retirement Board*, June 30, 1977.

[3] *Pension Task Force Report*, 1978, Table 25.

[4] State Teachers' Retirement System (information handbook), Montpelier, Vermont, July 1, 1977; Employees Retirement System of the State of Rhode Island, *Annual Report of the Retirement Board*, Providence, Rhode Island, June 30, 1977.

[5] Department of Management and Budget, *Guidelines of the Michigan Public School Employees' Retirement System*, Lansing, Michigan, 1977.

have received had he retired at age 60.[1] This early retirement benefit is derived from a standard annuity table and is the actuarial equivalent of the normal benefit. In another approach to computing early retirement benefits, the Louisiana statute established a parallel formula for the calculation of early retirement benefits in which each year of service earns a lower benefit than it would in the normal retirement formula.[2]

Most systems require retirement at age 65 or 70, although both Illinois and California have no mandatory retirement age.[3] However, it is expected that the mandatory retirement age will be universally raised to age 70 in compliance with the recently enacted federal law.[4]

Computation of Benefits

There are three elements which are used in the calculation of retirement allowances: the teacher's salary base, service credits, and a benefit formula. The benefit formula relates salary and service to determine the annual dollar value of the benefit. In more than a quarter of teacher systems (PTF), a fourth element, accumulated voluntary contributions by members, is added to the computation.[5] The annuity earned by the voluntary contributions supplements the allowance computed from the benefit formula.

Before discussing in detail the elements and methods used to determine retirement allowances, it is important to recognize that the computation of benefits is particularly sensitive to any changes in those three elements. To quickly demonstrate this sensitivity, consider a Texas teacher retiring after 25 years of teaching with an average salary base of $15,000. According to the Texas system benefit formula, his allowance would be figured as a specified percentage of his salary base

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[1] *The ABC's of Teacher Retirement System in Texas*, Austin, Texas, revised version, August 1977.

[2] *Teachers' Retirement System of Louisiana*, Baton Rouge, Louisiana, September 1978.

[3] National Education Association, *Teacher Retirement Systems*, 1976.

[4] P.L. 95-256, 1977.

[5] *Pension Task Force Report*, 1978, Table 18; supplemented by the TRS Reports.

(in this case, 2 percent) multiplied by his years of service. His allowance would be:

2% x 15,000 x 25(yrs.) = $7,500 annual allowance.

However, suppose his school system instituted salary increases during his career which raised his salary base to $18,000; his allowance then would be:

2% x 18,000 x 25(yrs.) = $9,000 annual allowance.

Suppose instead that the Texas system allowed him additional service credits for three years of out-of-state teaching; his allowance would be:

2% x 15,000 x 28(yrs.) = $8,400 annual allowance.

Finally, if the Texas legislature increased the percentage of the salary base from 2 percent to 2.5 percent, his allowance would be:

2.5% x 15,000 x 25(yrs.) = $9,375 annual allowance.

If all three situations occurred, the teacher's retirement income could increase to $12,600.

Salary Base. Various measures of the salary base are used in teacher retirement systems. In most systems covering teachers, the salary base is the average annual salary earned by the retirant over some time period near the end of his career. The Pension Task Force found that 90 percent of teacher plans used three-year to five-year averages.[1]

The annual salaries used in the salary base calculation may be chosen from varying time periods. For example, Alabama's salary base is the average of the three highest annual salaries out of the last

[1] *Pension Task Force Report*, 1978, Table 37; supplemented by the TRS Reports. In our sample, we found only one system that used a career average salary base.

ten years of service; West Virginia's uses the highest five years' salaries out of the last 15 years, and a Minnesota teacher's salary base is defined as the average of any five consecutive years during his career.[1] However, since the final years are generally the highest earning years in a teacher's career, the salary base is usually constructed from the final three to five years' salaries.

The method for computing the salary base, as well as salary increases, directly affects the size of the retirement allowance. With rising salaries over time, the longer the time period, the lower the salary base will be since lower salaries will be included in the averaging. To demonstrate this point, suppose a Texas teacher and a California teacher both retire with a final year's salary of $17,000. If both teachers had received annual salary increases of 6 percent,[2] their earnings for the last five years of their careers would be:

Year 1 - $13,466
Year 2 - $14,274
Year 3 - $15,130
Year 4 - $16,037
Year 5 - $17,000 - last year's salary

According to their respective plan provisions, the salary base for the Texas teacher would be the average of his final five year's salaries; the California teacher's salary base would be the average of his final three year's salaries. This results in salary bases of $15,167 and $16,043, respectively. Applied to identical benefit formulas, this would result in retirement allowances of:

Texas teacher: 2% x 15,167 x 25(yrs.) = $7,583,50 allowance.
California teacher: 2% x 16,043 x 25(yrs.) = $8,021.50 allowance.

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[1] Teachers' Retirement System of Alabama, *Questions and Answers: Retirement Allowances*, Montgomery, Alabama, October 1977; West Virginia Teachers Retirement System, *Highlights*, Charleston, West Virginia, July 1976; State of Minnesota Teachers Retirement Association, *New Teacher Retirement Information*, St. Paul, Minnesota, January 1978.

[2] In reality, of course, the salary increases and retirement conditions for the teachers in the two states would probably differ. The method for calculating the salary base and the 2 percent benefit formu-

Therefore, in this demonstration with identical salary histories, retirement conditions and benefit formulas, the method for calculating the salary base alone made a $400 difference in the retirement allowances received by the two teachers.

Given annual salary increases of 6 percent, a teacher's salary base would be 6 percent higher if averaged over a three-year rather than five-year period. In the case of the Texas teacher such an increase in his salary base alone would increase his original allowance to $7,950 from $7,500.

Some teacher retirement systems allow or require further increments or decrements in the salary base. Approximately 40 percent of teacher plans (PTF) add unused sick leave, overtime pay or longevity pay to the salary base.[1] This would inflate benefits. On the other hand, some plans impose limits on the salary base, hence, on benefits. Oklahoma and Iowa impose upper limits on the salary base--$10,000 and $20,000, respectively--and the hypothetical Texas teacher would be limited to a maximum salary base of $25,000.[2]

Service Credits. The total service credits accumulated by a retiree is the sum of total service in the system, creditable prior service, and other allowable service credits as defined by system rules. All plans (PTF, TRS) award one service credit for each year of full-time employment in the system; part-time service may be creditable, although the calculation of part-time service credits varies widely among systems. Most plans (PTF, TRS) have a minimum annual hourly requirement which must be satisfied in order to earn a one-year service credit; others give proportional service credits for part-time teaching (e.g., three-fourths of a year's credit for one year's part-time teaching).[3] "Prior

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las are part of the Texas and California system provisions. State Teachers' Retirement System of California, *Service Retirement*, Sacramento, California, September 1977; *The ABC's of Teacher Retirement System in Texas*, Austin, Texas, August 1977, p. 4.

[1] *Pension Task Force Report*, 1979, Table 36.

[2] State Teachers' Retirement System of Oklahoma, *Service Requirement*, Oklahoma City, Oklahoma, July 1, 1978; *The ABC's of Teacher Retirement Systems in Texas*, Austin, Texas, revised version August 1977. The Iowa system limits the size of the salary base by imposing a maximum on the annual salaries used in the salary base calculation. Iowa Public Employees Retirement System, *Your IPERS Benefits*, Des Moines, Iowa, 1976.

[3] *Pension Task Force Report*, 1978, Table 17; supplemented by the TRS Reports.

service"--service rendered in the district prior to the initiation of the retirement system--is commonly credited automatically and without charge to the employee. Prior service credits are usually relevant to benefit computation only in newer systems.[1]

Most teachers may earn additional credits for service other than teaching in schools covered by their retirement systems. The types of additional credit allowed by a retirement system should be important to a teacher since it not only could result in an increased or decreased retirement allowance but could also significantly affect his career decisions. Suppose, for example, that a teacher wished to transfer to another state. If he moved to Ohio, he would receive credit for his years of teaching outside the state; if he moved to Colorado, he would lose those years of credit. If a teacher in Georgia wished to interrupt his career for sabbatic study, he would receive credit for that period of time; a Utah teacher would not. Suppose a teacher wished to stop teaching for several years, perhaps for maternity leave. Years later when she returned to teaching, she could receive credit for those earlier years of service if she belonged to the Tennessee system; if she belonged to the Iowa system, she could not. Finally, suppose that a person wanted to change occupations. In Montana, service credits earned by a person in the Public Employee's retirement system are automatically credited to the Montana teachers system and without cost to the employee.

More liberal service credit provisions are obviously desirable to teachers, but are more costly to the retirement systems which must fund the increased retirement allowances that would be earned. Therefore, even in systems with liberal provisions, those years of extra credit must be "purchased" either through the direct transfer of funds from one system to another (e.g., between the Chicago and the Illinois systems) or from additional contributions made by the teacher.[2] However, even if

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[1]Nearly two-thirds of local systems in our sample were established prior to 1910. Of the three systems established after that time, only one did not automatically credit prior service. (National Education Association, *Teacher Retirement Systems*, 1976.)

[2]"Purchasable" service credits are allowable according to the plan regulations. If the service (be it out-of-state teaching, military service, sabbatical, etc.) is purchasable, the employee must pay to the system some portion of the actuarial cost of the benefits which that additional year of credit will earn for him. Generally, the cost is

the additional service credits must be purchased, liberal provisions are still advantageous to the members of a teacher retirement system. Suppose, for instance, that a teacher moved from Texas to Ohio. At age 60 with 25 years of service (and a salary base of $15,000) he would receive an annual retirement allowance of $6,375. However, according to the Ohio provisions he may elect to purchase five additional credits for his years of teaching in Texas at a cost of approximately $4,800.[1] It is conceivable, then, that for a $4,800 investment, he could increase his annual retirement allowance from $6,375 to $9,000, a difference of $2,625 per year. It should also be remembered that, as we explain on page 35, a teacher who leave one retirement system for another generally withdraws the contributions he has made to the old system. Therefore, in many cases, the purchase of out-of-state credit amounts to a simple transfer of funds from one system to another.

Most teachers may receive credit for out-of-state teaching; however, for the reasons stated above, credit for years of out-of-state teaching without cost to the member is very rare. Usually, in order to be eligible to purchase out-of-state credits, the teacher must fulfill a minimum service requirement in the system and must contribute the actuarial equivalent of the contributions he would have made to the system during the years for which credit is given. In about half the teacher and school employee systems (PTF), the employee contributes less than the full actuarial cost to the system; the system finances the remainder.[2] About three-quarters of all teachers belong to a system which allows the purchase of out-of-state service credits (PTF).[3] However, "purchases" are almost always limited to 5 to 10 years.

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greater than the contributions he ordinarily would have made to compensate for lost investment on those contributions.

[1]According to the Ohio system provisions and assuming that the teacher earned about $12,000 per year earlier in his career, each year of out-of-state credit would cost approximately $960. The figure does not include the 6 percent compound interest that would be charged if the Ohio teacher delayed purchasing the credits until later in his career. The State Teachers' Retirement System of Ohio, *Purchasing Service Credit*, Columbus, Ohio, 1976.

[2]*Pension Task Force Report*, 1978, Table 47.

[3]*Pension Task Force Report*, 1978, Table 47; supplemented by TRS reports.

Service credit without cost for previous years of teaching occurs more frequently when transferring between a state retirement system and a local system operating in that state. In order to automatically transfer service credits without purchase, a reciprocal agreement must exist between the two systems. As teachers move between the systems, years of service and both employee and employer contributions are credited to the teacher's new account. Depending upon the agreement, the funds may or may not be actually transferred to the new system. According to the Pension Task Force, most state retirement systems have reciprocal agreements with both other instate local teacher and state non-teacher retirement systems.[1] While only about 20 percent of local teacher plans (PTF, TRS) grant credit for other instate teaching without cost, these plans are generally the largest local systems and cover over three-quarters of the teachers in local systems.[2] For example, both the New York City and Chicago teacher systems maintain reciprocal agreements with their respective state systems.[3] This means that a New York City teacher may move to another school system in New York state and switch to the state retirement system without loss of benefit credits or accumulated interest on his contributions. If agreements do not exist between state and local systems, service credits must be purchased. For example, the state system in Missouri requires teachers to buy Kansas City and St. Louis service credits in the same manner as out-of-state teaching credits.[4]

The Pension Task Force report supplemented by our sample (TRS) indicates that service credits are generally transferable between a state teacher system and state and local government employee systems which operate in the same state.[5] For example, the Montana teacher system

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[1] *Pension Task Force Report*, 1978, Table 47.

[2] *Pension Task Force Report*, 1978, Table 47; supplemented by TRS reports.

[3] New York State Teachers' Retirement System, *Prior Service and Transfer of Credit*, Albany, New York, 1977-78; National Education Association, *Teacher Retirement Systems*, 1976, p. 33.

[4] The Public School Retirement System of Missouri, *Missouri Teacher Retirement*, Jefferson City, Missouri, October 1975.

[5] *Pension Task Force Report*, 1978, Table 47.

credits any state or local government employment within the state; conversely, credits earned in the teacher system may be transferred to the Montana Public Employees' Retirement System.[1]

Almost all systems (PTF, TRS) allow employees to purchase credit for authorized military leaves and sabbatic study. Other forms of creditable service depend upon the specifics of plan provisions.[2] From our sample (TRS), military service is generally credited without cost if a teacher is drafted or serves during a national emergency, interrupting his career; however, prior military service is often purchasable,[3] depending upon the plan provisions. Other activities may result in allowable credits. Alaska automatically credits up to 15 years of work in the Bureau of Indian Affairs; Ohio allows up to 5 years credit for teaching in private schools in or outside Ohio.[4] California offers the widest range of possible service credits. Along with military service, a California teacher may also purchase credit for sabbatic leave, Fulbright leave, and employment in the Red Cross, Job Corps, university teaching, and certain types of child care.[5]

The Benefit Formula. The retirement allowance formula relates the relevant elements--usually salary base and service credits--to determine the amount of the benefit a retiree may receive. There are two types of retirement benefit formulas used by teacher retirement plans: flat rate and unit benefit.

In a *flat rate* formula, once a teacher qualifies for retirement, his annual retirement benefit is calculated as a flat percentage of his salary base. Consequently, a teacher would not receive a higher percentage of his salary base if he worked beyond the normal retirement

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[1]Montana Teachers' Retirement System, *Handbook of Information*, Helena, Montana, July 1, 1977.

[2]*Pension Task Force Report*, Table 47; supplemented by the TRS reports.

[3]Ibid.

[4]Alaska Teachers' Retirement System, *Information Handbook*, Juneau, Alaska, July 1977; The State Teachers Retirement System of Ohio, *Service Retirement*, Columbus, Ohio, 1977.

[5]State Teachers Retirement System in California, *Additional Service Credits*, Sacramento, California, 1977.

service requirement. In the *unit benefit* method, on the other hand, each year of service entitles a retiree to an increased percentage of his salary base. Therefore, additional years of service earn additional percentage increments of the base salary.

While the flat rate formula is common for some public employee systems (e.g., police and fire), it is one of the least popular benefit formulas used by teacher systems.[1] In fact, the Iowa system, which covers all state employees and teachers, was the only plan in our sample which used a flat percentage formula. Once an Iowa employee qualifies for retirement, he receives a benefit of approximately 44 percent of his salary base, independent of his length of service.[2] Therefore, an Iowa teacher who retires at age 65 with a salary base of $15,000 would receive a retirement allowance of:

44% x 15,000 = $6,600 annual allowance.

The most common method of benefit calculation used by teacher systems is the *unit benefit* method. The unit benefit method calculates the annual allowance by multiplying a stipulated percentage of the employee's salary base by the years of service credits he has accumulated. For example, the California plan provisions set the formula percentage at 2 percent.[3] A California teacher who retired after 25 years service with a salary base of $15,000, would be entitled to an allowance of:

2% x 15,000 x 25 = $7,500 annual allowance.

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[1] *Pension Task Force Report*, 1978, Table 38.

[2] The flat percentage formula, adopted in 1976, is used for all new members. Retirement benefits for members who joined prior to 1976 are calculated using either the flat percentage formula or the old unit benefit formula (1.57 percent x years of service x salary base), whichever results in the higher benefit. Iowa Public Employees Retirement System, *Your IPERS Benefits*, Des Moines, Iowa, 1975.

[3] State Teachers Retirement System of California, *Service Retirement*, Sacramento, California, September 1977.

The wide variation in allowances provided by plans is a result of differences in the percentage multiplier and how it is applied to the years of service and the salary base. As we demonstrated in our Texas teacher example on p. 15, a .5 percent change in the multiplier can cause a considerable change in the allowance a retired teacher receives. Within the broad category of unit benefit formulas, there are three basic types which are used in teacher retirement allowance contributions: *single rate*, *step rate*, and *variable rate*.

The *single rate* formula is used by most teacher plans. In a single rate formula, like the one used in California, a flat percentage (usually between 1.5 and 2 percent) is applied to the employee's salary base. This represents the benefit amount earned for each year of service. To compute the total annual allowance, this amount is multiplied by the number of service credits earned by the employee. The most important feature of a flat rate formula is that the percentage multiplier is constant for all levels of salary or service credits. A single rate formula may or may not be integrated with Social Security, although most are not. South Dakota is an example of a system that is partially integrated with Social Security. A South Dakota retired teacher receives either:

1% x salary base x service credits OR

2% x salary base x service credits - Social Security and other public benefits

whichever results in the higher benefit.[1]

The *step rate* formula applies different multipliers to different portions of a retiree's salary base. It is ordinarily used in systems which are fully integrated with Social Security. In this unit benefit method, an employee receives a lower benefit for the portion of his salary on which his Social Security benefits are historically based. Therefore, the plan provisions designate a salary base "breakpoint" and apply a different multiplier to the salary base above and below

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[1]Sec. 3-13-01, *South Dakota Retirement System Law*, Pierre, South Dakota, July 1977.

that point.[1] To illustrate, the Tennessee benefit using a $7,800 "breakpoint" is calculated as follows. For a teacher having a $15,000 salary base, a lower rate (1.5 percent) is applied to the salary below the breakpoint; a higher rate (1.75 percent) is applied to the salary above the breakpoint.

[1.5% x 7,800 + 1.75% x 7,200] x 25(yrs) = $6,075 annual allowance.

The *variable rate* formula applies different multipliers to different portions of the retirees' service credits. It is widely used in systems which have recently revised either their benefit formula or service requirements and is a convenient way to make prospective benefit changes. In a variable rate formula, the multiplier changes with the number of service credits or when the service accrued. For example, the Arizona formula uses a benefit multiplier of 1.5 percent for past service credits (for service performed prior to July 1967) and 2 percent for current service credits.[2] Similarly, Illinois multiplies the salary base by 1.67 percent for the first ten years of service, by 1.9 percent for the second ten years, and 2.1 percent of the third ten years, and 2.3 percent for all years of service over 30, up to a limit of 38 years.[3] Therefore, a retiring Illinois teacher with 25 years of service and a salary base of $15,000 would receive:

(1.67% x $15,000 x 10) + (1.9% x $15,00 x 10) + (2.1% x $15,000 x 5) = $6,930 annual allowance.

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[1]These breakpoints are historically tied to the Social Security contribution base. For example, as of 1975, the South Carolina system used a $4,800 "breakpoint" (which was the maximum taxable earnings for Social Security from 1960-1965) and Tennessee uses a $7,800 "breakpoint" (maximum taxable earnings from 1968-1971). (*Tennessee Consolidated Retirement System*, Nashville, Tennessee, January 1977; South Carolina formula information from: National Education Association, *Teacher Retirement Systems*, 1976, pp. 102-103.)

[2]Arizona State Retirement Plan, *Information Booklet*, Phoenix, Arizona, July 1978.

[3]Teachers' Retirement System of the State of Illinois, *Retirement*, Springfield, Illinois, September 1977.

An increasing multiplier such as this might be used to encourage teachers to remain employed longer. On the other hand, Colorado applies a reduced multiplier for all years of credit over 20. This might create incentives for earlier retirements.

Early Retirement. Almost all teacher retirement systems have provisions which allow retirement prior to the normal or optional retirement age. However, if a teacher elects to retire early, his annual retirement allowance will be less than if he had remained in the system until eligible for normal or optional retirement. The reduction in benefits occurs for three different reasons. First, he will have fewer service credits than he would have at normal retirement. Second, he will receive benefits over a longer time period, hence his *annual* benefit must be reduced to maintain "actuarial" equivalence with the normal retirement benefit. Third, his salary base is likely to be lower.

At least half of the systems in our sample (TRS) indicated that early retirement benefits are "actuarially reduced" according to individual teacher characteristics and other actuarial considerations. In the remaining systems, the early retirement allowance is computed by a separate formula or the normal allowance is reduced by a set percentage according to the age of the retirant or the number of service credits. This may or may not result in actuarial equivalence. For example, for normal retirement, California uses a flat rate formula of 2 percent of the salary base multiplied by the service credits. In the case of early retirement, the 2 percent factor is reduced 0.01 percent for every month under the normal retirement age.[1] The allowance formula for a teacher retiring one year early would use a multiplier of 1.88 percent rather than 2 percent. This formula results in a total allowance reduction of 6 percent for every year prior to the normal retirement age that a teacher retires.

The most common method of calculating the early retirement reduction is by reducing the total allowance directly in proportion to the gap between normal and actual retirement age and service credits of the retiree. Nearly 60 percent of the systems (TRS) using this method

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[1] State Teachers Retirement System of California, *Service Retirement*, Sacramento, California, September 1977.

reduce the full retirement allowance by 6 percent for every year under the normal retirement age or under the minimum service requirement.[1] Maryland, for instance, has a normal retirement age of 60; therefore, a teacher retiring at age 60 with a salary base of $15,000 and 25 years of credit would receive an allowance of:

1.8% x 15,000 x 25 = $6,750 annual allowance.

However, if the teacher elected to retire at age 55 with 25 years of service at the same salary base, the allowance would be reduced by 6 percent for each of the five years under the normal retirement age of 60. Therefore, the early retirement allowance would be:

1.8% x 15,000 x 25 = $6,750 annual normal retirement allowance.
$6,750 - 30% (or $2,025) = $4,725 annual early retirement allowance.[2]

"Social Security leveling" is another form of early retirement option which is offered by a small percentage of systems.[3] Its purpose is to provide a retiree with a higher annual allowance during the years before he is eligible for Social Security benefits. Social Security leveling is offered only to an early retiree and entitles him to a higher monthly allowance during the early years of retirement and a reduced allowance after the retiree begins to receive Social Security benefits.

In the system's *Handbook for Members*, the Virginia Retirement System illustrated how this option works. A male teacher who retires at age 62 with 30 years service and a salary base of $10,000 would receive an annual retirement allowance of $4,500. However, if he chose the Social Security leveling option, he would receive an increased

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[1]The TRS Reports.

[2]Maryland State Retirement System, *Retirement Allowances*, Baltimore, Maryland, July 1, 1977.

[3]In our sample, the Social Security leveling option was found in seven systems: Idaho (1976), Indiana (1977), Michigan (1977), South Dakota (1977), Tennessee (1977), Vermont (1977), and Virginia (1975).

allowance of $7,425 every year prior to age 65. At age 65, his allowance would be reduced to only $3,858.[1] Presumably, however, the Social Security benefits that he would begin to receive at that age would make up the difference and therefore maintain a level income throughout his retirement.

Allowances Earned on Additional Employee Contributions. After the formula allowance is calculated, some systems provide that a retiree's allowance may be increased by the addition of an annuity which is earned on a member's contributions to the system. These contributions may be either mandatory or voluntary. In our sample (TRS), approximately 25 percent of teacher systems allowed members to make *voluntary* contributions of up to 10 percent of their yearly salary. (California allows contributions of up to 20 percent and Utah permits unlimited contributions.)[2] At retirement, an annuity purchased with these contributions and the interest earned on them are added to a member's total allowance. A few systems increase the formula benefit by adding an annuity based on a member's *mandatory* contributions. For example, the Indiana benefit allowance is the sum of a formula pension provided by the system (1.1% x salary base x service credits) plus an annuity based upon a member's mandatory contribution of 3 percent of his yearly salary.[3]

Minimum and Maximum Allowances. At least half the teacher systems (PTF) have provisions for a guaranteed minimum allowance, although sometimes a service requirement must be satisfied. Some provide flat minimum amounts varying from $840 per year with 20 years credit in North Carolina to $1,200 annually in Maine with 10 years of service.[4] Other minimums are directly related to length of service. Washington,

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[1] Virginia Supplemental Retirement System, *Handbook for Members*, Richmond, Virginia, n.d., p. 7.

[2] State Teachers Retirement System of California, *Tax-Sheltered and Voluntary Annuity Deposits*, Sacramento, California, September 1977; Utah State Retirement System, *Highlights*, Salt Lake City, Utah, July 1977.

[3] Indiana State Teachers' Retirement Fund, *Member's Handbook*, Indianapolis, Indiana, November 1977.

[4] Sec. 135-5(d), *Retirement System for Teachers and State Employees of North Carolina*, Raleigh, North Carolina, 1975; *Report of the Maine State Retirement System*, Augusta, Maine, January 1978.

for instance, grants a minimum annual allowance of $78 for each year of service.[1]

About one-third of teacher retirement plans (PTF) have provisions for a maximum allowance which is often set at a flat percentage of the salary base.[2] Although it can be set as low as 75 percent of an employee's salary base (as in Connecticut), Louisiana allows a maximum allowance equal to the salary base.[3]

Retirement Payment Options

The retirement allowance calculations outlined above are for full benefits. How those benefits are paid to the retirant depends upon what guarantees accompany the payment. The more liberal the guarantees, the lower the payment. All options, however, are actuarially equivalent.

Single Life Annuity. This payment option guarantees retirement payments during the retirant's lifetime. Therefore, this option usually provides the highest monthly annuity possible. This form of retirement payment is offered by all systems and, if a retiring member has not elected one of the following options, his pension is automatically paid as a single life annuity.

Annuity Certain. Like the single life annuity, this option provides payments throughout a teacher's retirement. However, it also offers limited survivor's benefits by guaranteeing annuity payments over a definite period of time. If a retirant chooses this option, he or his beneficiaries are guaranteed to receive annuities over a specific period of time, usually 5 to 10 years. Should the retirant die before the full 60 or 120 monthly payments have been made, his beneficiary would receive the remaining payments. If the retirant outlives the 5 or 10 year "annuity certain" period, he continues to receive payments until his death, but no survivor's benefits are paid. Approximately

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[1]Teachers' Retirement System of the State of Washington, *Actuarial Valuation as of June 30, 1976*, July 1977.

[2]*Pension Task Force Report*, 1978, Table 26.

[3]Teachers' Retirement Board, *Connecticut State Teachers Retirement System*, Hartford, Connecticut, 1976 edition; *Teachers' Retirement System of Louisiana*, Baton Rouge, Louisiana, September 1978.

50 percent of teacher systems (PTF) offer this type of option.[1]

Modified Cash Return. This payment option ensures that a member will receive his total retirement allowance, either in the form of annuities during his lifetime or in limited survivor's benefits after his death. Under this option at a member's death, the remaining funds in his retirement account, if any, are awarded to his beneficiary in a lump sum. In some systems a retirant must accept an actuarially reduced annuity if he chooses this option; other systems routinely return remaining contributions without the actuarial reduction in lifetime annuities. The *Pension Task Force Report* found that 75 percent of teacher systems offered this payment option.[2] Table III-2 below illustrates how the modified cash return and the various survivor's benefits affect the annual allowance received by a retired teacher.

Table III-2

THE EFFECT OF SELECTED PAYMENT OPTIONS ON A SAMPLE ANNUAL RETIREMENT ALLOWANCE[a]

Option	Annual Allowance
Modified Cash Return (or Single Life Annuity)[b]	$6,075.00
100% Joint Life Annuity	5,382.45
50% Joint Life Annuity	5,704.43
100% Joint Life Annuity w/"Pop-up" Provision	5,188.05
50% Joint Life Annuity w/"Pop'up" Provision	5,595.07

SOURCE: Tennessee Consolidated Retirement System, *Member Handbook*, Nashville, Tennessee, January 1, 1977.

[a]These figures are assuming a female teacher retires at age 60 with 25 years of service and a final salary base of $15,000. Her beneficiary is a male, also aged 60.

[b]Under Tennessee system provisions, the single life annuity also provides for the return of remaining member contributions, as in a modified cash return plan.

[1]*Pension Task Force Report*, 1978, Table 33.

[2]Ibid. These data do not include mixed coverage systems.

Survivor's Benefits. A retiree may elect to spread out his retirement allowance payment over his lifetime and that of his beneficiary. However, since this option is likely to result in greater payments than any other option, it usually also results in the greatest actuarial reduction in the monthly benefit. The most common form of survivor's benefit is the joint life annuity which assures the beneficiary of receiving a lifetime annuity after the retirant's death. A "full" lifetime annuity (or 100 percent joint life annuity) provides for a survivor's annuity equal to that received by the retiree, and is available in almost all systems.[1] Many systems also offer survivor's annuities equal to some fraction of the full annuity, with higher monthly payments.

Four systems in the TRS sample (New York, Ohio, Tennessee, and Utah) offer a special "pop-up" provision in addition to the joint life annuity survivor's benefits.[2] In general, survivor's options must be selected prior to retirement and the beneficiary may not be changed. Therefore, if a member chooses a joint life annuity option and his beneficiary predeceases him, his monthly annuity remains the same and his survivor's benefits are lost. However, if a retiree elects a "pop-up" provision and his beneficiary predeceases him, the survivor's benefits are lost but his monthly annuity "pops up" to the maximum annuity allowed (e.g., as if it were a single life annuity).

POST-RETIREMENT ADJUSTMENTS

Post-retirement allowance adjustments are a significant feature of a plan's benefit package since such increases are intended to allow benefits to keep up with the rising cost of living. If inflation continues at its present rate, the amount and frequency of post-retirement benefit adjustments will become increasingly important to teachers if the adequacy of their retirement benefits is to be maintained. For

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[1] *Pension Task Force Report*, 1978, Table 33.

[2] New York State Teachers' Retirement System, *Options*, Albany, New York, 1977-78; The State Teachers Retirement System of Ohio, *Service Retirement*, Columbus, Ohio, 1977; *Tennessee Consolidated Retirement System*, Nashville, Tennessee, January 1977; Utah State Retirement System, *Guideline to Retirement*, Salt Lake City, Utah, July 1977.

example, consider a teacher who retired with an annual allowance of $7,500 in 1970. If he received an automatic post-retirement increase of 5 percent per year (the largest increase currently offered), his retirement allowance would now equal $11,635. However, in real terms, the purchasing power of that increased allowance would have *decreased* by 39 percent due to inflation. In fact, to keep pace with inflation over the past ten years would have required a post-retirement increase of almost 9 percent per year. Therefore, teacher retirement systems are likely to come under continuing pressure to liberalize their benefit adjustment provisions by, in some way, coordinating the adjustments with changes in the Consumer Price Index. Many systems, however, assert that liberalized post-retirement adjustments would be difficult, if not presently impossible, to fund. However, the state or local system's ability to fund such increases can only be evaluated based upon the fiscal capacity of the tax base which supports it. For a more complete discussion of this issue, we refer the reader to Richard B. Victor, *The Financial Condition of Teacher Retirement Systems* (see Preface).

Ninety-five percent of all teachers (PTF) belong to a retirement system offering some form of post-retirement benefit adjustment.[1] Post-retirement benefit adjustments--or cost-of-living increases--may be made in three forms: ad hoc adjustments, automatic adjustments by a constant percentage, and variable adjustments. Table IV-3 presents teacher retirement systems according to the type of adjustment offered in their benefit packages.

Ad Hoc Adjustments

Ad hoc adjustments, as the name implies, are not made on a regular basis nor are the amounts of the increases set by statute. Instead, the increases of varying amounts are awarded at the discretion of the retirement board or the state legislature. The Pension Task Force estimates that most teacher systems have granted ad hoc adjustments at one time or another.[2] In general, ad hoc adjustments tend to be larger

[1] *Pension Task Force Report*, Table 40; supplemented by the TRS reports.

[2] Ibid. This data does not include mixed coverage systems.

Table III-3

TEACHER RETIREMENT SYSTEMS BY TYPE OF POST-RETIREMENT BENEFIT ADJUSTMENT
(Year of Information)

Automatic Adjustment	Variable Adjustment	Ad Hoc or No Adjustment
Arkansas-1.5% (1977)	Alaska-4% limit (1977)	Alabama (1977)
California-2% (1977)	Georgia-3% limit (1978)	Arizona (1978)
Chicago, Ill.-2% (1977)	Louisiana-3% limit (1978)	Des Moines, IO (1976)
Colorado-3% (1977)	Maine (1977)	Duluth, MN (1977)
Connecticut-3% (1976)	Maryland (1977)	Indiana (1977)
Denver, CO-2% (1976)	Mississippi (1977)	Iowa (1975)
Hawaii-2.5% (1977)	Missouri-2% limit (1975)	Kansas (1977)
Idaho-1% + ad hoc increases (1976)	New Jersey (1973)	Massachusetts (1966)
Illinois-2% (1977)	N. Carolina (1975)	Michigan (1977)
Kentucky-1% + ad hoc increases (1975)	Ohio-2% limit (1978)	Milwaukee, WI (1975)
Nevada-2% (1977)	Oregon-2% limit (1978)	Minneapolis, MN (1976)
Rhode Island-3% (1977)	S. Carolina-4% limit (1975)	Minnesota (1978)
S. Dakota-2% (1977)	Tennessee-3% (1977)	Montana (1977)
	Utah-4% (1977)	Nebraska (1975)
	Vermont-5% limit (1977)	New Hampshire (1975)
	Virginia-5% limit (1975)	New Mexico (1977)
	Washington-3% limit (1976)	New York (1978)
		N. Dakota (1978)
		Oklahoma (1978)
		Pennsylvania (1977)
		St. Paul, MN (1975)
		Texas (1977)
		West Virginia (1976)
		Wisconsin (1975)

than automatic or variable increases, but occur less frequently. For example, as of 1975, the Texas legislature had approved ten post-retirement benefit adjustments in the 38-year history of the system,

including four adjustments since 1971. The 1975 adjustment granted benefit increases of 5 to 18 percent.[1] Similarly, in 1972, Kansas awarded all retirees under the "old system" (those who retired prior to 1971) a one-time benefit increase of 2 to 32 percent depending upon their date of retirement.[2]

Automatic Adjustments

Automatic annual adjustments are mandated by statute and are formally a part of the benefit provisions. They are generally lower than ad hoc adjustments but occur on a more regular basis. About 15 percent of teacher systems (PTF) provide automatic annual increases which commonly range from 2 to 3 percent.[3]

Variable Adjustments

At least 25 percent of state teacher systems and 15 percent of local teacher systems (PTF) award post-retirement adjustments which depend upon some internal or external indicator, such as the change in the Consumer Price Index or the system's investment earnings.[4] The Mississippi plan provisions, for example, allow a discretionary 1.5 percent annual benefit increase if justified by the system's investment earnings.[5] Teachers in Alaska receive one of the most generous post-retirement adjustments provided by teacher systems. In addition to an automatic 10 percent increase in the retirement allowance if a retiree remains in the state, an Alaskan teacher *may* receive a 4 percent annual increase. "May" is an important word in variable increases since the increase is often awarded at the discretion of the retirement board

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[1] National Education Association, *Teachers Retirement Systems*, 1967, p. 107.

[2] Section 74-4945, *Kansas Public Employees Retirement Act*, July 1976.

[3] *Pension Task Force Report*, 1978, Table 40.

[4] *Pension Task Force Report*, 1978, Table 40. This data does not include mixed coverage systems.

[5] Public Employees' Retirement System of Mississippi, *Service Retirement*, Jackson, Mississippi, May 1977.

and may be granted only as the additional funds become available. In fact, the Alaska retirement statute states that:

> When the administrator determines that the *cost of living has increased and that the financial condition of the retirement fund permits*, he may increase all service retirement and survivor's benefits salaries to reflect this cost of living increase.[1]

VESTING

Vesting gives an employer's guarantee that an employee will eventually receive a benefit based on his contributions and years of service to that date. Once an employee's pension is vested, he need not work for that employer continuously until retirement in order to receive a retirement benefit. In other words, that employee has earned an irrevocable "vested interest" in that retirement system.

Vesting is awarded in the overwhelming majority of teacher pension systems (PTF, TRS) regardless of size or level of administration.[2] Generally, vesting is earned after completion of a service requirement that varies from 5 to 20 years. In local systems, with average service requirements for vesting of 10 to 15 years, benefits tend to vest later than in state systems. Benefits in more than half of state teacher systems (PTF, TRS) vest after 5 to 10 years.[3] Two extreme examples of vesting requirements are Wisconsin, which has immediate vesting (no service requirement) and New Mexico in which benefits vest only after a teacher qualifies for retirement.[4]

Breaks in Service

Most teacher systems (PTF) allow as many breaks in service as desired without loss of prior service credits, unlike almost half the

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[1] AS 14.20.280-350.

[2] *Pension Task Force Report*, 1978, Table 21; supplemented by the TRS reports.

[3] Ibid.

[4] The Wisconsin data are from National Education Association, *Teacher Retirement Systems*, 1976, pp. 124-126; the New Mexico data are from Educational Retirement Board, *Educational Retirement Act and Retirement Reciprocity Act*, Santa Fe, New Mexico, July 1, 1977.

police and fire systems which require continuous service until retirement.[1] In addition, authorized leaves for maternity and sabbatic study are usually granted without constituting a break in service. However, when a member leaves the system or stops teaching, he must decide whether to leave his contributions on deposit or withdraw them. In order to qualify for a deferred benefit, a member must be vested and leave his contributions on deposit with the system after termination. Even if a teacher is vested, if he chooses to withdraw his contributions, perhaps to purchase credits in another system, he forfeits his rights to all benefits offered by the system. For example, if a Georgia teacher drops out of the labor force but leaves his contributions on deposit with the system, he is still covered by the system disability protection and survivorship benefits.[2] However, if the member is not yet vested, he generally must withdraw his contributions within a specified amount of time (which according to our sample (TRS) varies from six months to four years). In 90 percent of the plans (PTF, TRS), these contributions are refunded with 4 to 5 percent accrued interest.[3]

When a teacher withdraws his contributions, he loses the service credits earned to that point and any employer contributions made on his behalf. However, if he returns to the system, he may "buy back" those service credits by redepositing the withdrawn contributions plus any interest that might have accrued had the contributions remained in the retirement account.[4] In this way, buy-back provisions are similar to out-of-state credits. Approximately 90 percent of state retirement systems covering teachers have "buy-back" provisions, while only 65 percent

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[1] *Pension Task Force Report*, 1978, Table 24. This data does not include mixed coverage systems.

[2] This protection continues up to four years after the teacher's termination.

[3] *Pension Task Force Report*, 1978, Table 20. In our sample, four systems: Colorado (1977); Minnesota (1978); Chicago, Illinois (1977); and Rhode Island (1977), refund contributions without interest and Oklahoma (1978) and Missouri (1975) only refund contributions with interest after at least five years of service.

[4] The accrued interest deposit is required regardless of whether the contributions were originally refunded with interest.

of local system do (PTF).[1] However, several of our sampled plans (TRS) required teachers re-entering the system to buy back the credits within a specific time period. For example, Nebraska allows a teacher to buy back those service credits if he re-enters the system within three years of withdrawing his contributions.[2]

POST-RETIREMENT WORK

Some systems limit the amount of post-retirement work which a retired teacher may perform in order to supplement his retirement allowance. In general, a retirement allowance is not affected by any amount of work or earnings outside of the system. Therefore, a retired teacher may work as much as he desires in private schools, in other private sector jobs, or in another area of public employment as long as it is not covered by his pension system.

Part-Time Teaching

Part-time teaching within the system is allowed by nearly all of state and local systems covering teachers (TRS).[3] Although Georgia allows unlimited substitute teaching after retirement,[4] most systems limit either the number of days a retiree may work or the amount he may earn. Earnings limits for substitute teaching are typically between $2,000 to $4,000 annually. A Connecticut teacher may earn up to $3,600 a year in covered teaching and, in North Carolina, a retiree's post-retirement earnings in teaching plus his annual annuity may not exceed his final salary base.[5] Many systems restrict teachers to an average

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[1] *Pension Task Force Report*, 1978, Table 20.

[2] *Nebraska School Employees Retirement System*, Lincoln, Nebraska, revised October 1975.

[3] The TRS Reports.

[4] Teachers Retirement System of Georgia, *TRS Facts--A Member's Guide to the Teachers Retirement System of Georgia*, Atlanta, Georgia, 1977-78.

[5] Teachers' Retirement Board, *Connecticut State Teachers Retirement System*, Hartford, Connecticut, 1976 edition; Sec. 135-3(7)e; *Retirement System for Teachers and State Employees of North Carolina*, Raleigh, North Carolina, 1975.

of 60 to 90 days of substitute teaching. For instance, Vermont allows up to 60 days of substitute teaching or regular part-time teaching with an earnings limit of one-third the average teacher's salary in the state.[1]

In most cases, if a retiree exceeds these limits, his retirement allowance is either reduced or suspended.

DISABILITY BENEFITS

Virtually all teacher retirement plans offer some form of disability benefit. (The only exception in our sample (TRS) is the Iowa state system. However, Iowa workers are covered by the Social Security system disability protection.)[2] Most have minimum service requirements of up to 10 years for service-connected disability and 5 to 15 years for nonservice-connected disability.[3] Approximately half of the systems (TRS) award disabled teachers an annual allowance based on a flat percentage of salary at the time of disability. For example, the basic disability compensation in Colorado is 50 percent of the employee's current salary.[4] The remaining systems determine disability benefits by using the same formula that is used in the computation of regular retirement benefits. About 75 percent of these systems figure the disability benefits based upon service years earned to date, without the reduction for age, as in early retirement.[5] For example, a disabled

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[1]Board of Trustees, *State Teachers' Retirement System*, Montpelier, Vermont, July 1, 1977.

[2]Iowa Public Employees Retirement System, *Your IPERS Benefits*, Des Moines, Iowa, 1975 (including amendments effective July 1978).

[3]*Pension Task Force Report*, 1978, Tables 27 and 28.

[4]Colorado, like many other systems, offers another method of disability benefit calculations. A Colorado teacher may instead be awarded a disability benefit equal to the regular service allowance he would have received had he continued service until normal retirement age, if this calculation results in a lower benefit. (Public Employees' Retirement Board of Colorado, *Know Your Colorado Retirement*, Denver, Colorado, December 1977.)

[5]The TRS Reports.

Nevada teacher with 10 years credit and a salary base of $12,000 would receive a life-time disability allowance of:

2.5% x 12,000 x 10(yrs) = $3,000.[1]

In other system formulas, the years of service are increased to the number the teacher would have accumulated if he had continued service until normal retirement age. For example, Virginia disability benefits are figured using the standard Virginia retirement formula; however, the service credits are substantially increased to provide a higher benefit than the service credits would otherwise have earned.[2] Therefore, a disabled Virginia teacher under the same circumstances as the previous example would receive:

1.5% x 12,000 x 20(yrs.) = $3,600 annual allowance.[3]

Only about 20 percent of teacher systems (PTF) have provisions which offset disability benefits dollar for dollar by other forms of public assistance such as Workmen's Compensation or Social Security.[4]

DEATH BENEFITS

Although post-retirement survivor's benefits are optionally available to a member, almost all systems (TRS) provide a pre-retirement death benefit equal to the member's accumulated contributions, usually in a lump sum.[5] Eligibility for this type of death benefit generally

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[1] NRS 286.620, 1977.

[2] In calculating disability benefits, the Virginia system either doubles the number of service credits earned to date or increases them to the number the teacher would have earned by age 60, whichever is smaller. (Virginia Supplemental Retirement System, *Handbook for Members*, Richmond, Virginia, 1976.)

[3] The Virginia disability allowance including Workmen's Compensation and 50 percent of the Social Security benefits must equal at least 66 percent of the teacher's salary base (Ibid., 1976).

[4] *Pension Task Force Report*, 1978, Table 31. This data does not include mixed coverage systems.

[5] The TRS reports.

requires the completion of only one year of teaching. The Pension Task Force estimated that about 40 percent of teacher retirement plans offered an additional death benefit which we found in our sample (TRS) to be either 1-2 year's salary or a refund of the contributions made by the employer on the member's behalf.[1] For example, Maine offers an additional death benefit of 1-2 year's salary or a life annuity of $100-$300 per month.[2] About 70 percent of teacher pension (PTF) plans offer survivor's benefits and 60 percent also offer benefits for children or other dependents should a member die prior to retirement age.[3]

A simple pre-retirement death benefit, which usually consists of the return of the member's contributions, is available after as little as one year of service. However, survivor's benefits usually require either 10 to 15 years of service or the number of years of service required for vesting. The Montana system returns an employee's contributions should he die before he is vested. However, once a Montana teacher is vested (5 years of service) the survivor's benefits increase to a lump-sum death benefit of $500 plus a monthly annuity equal to the retirement credits earned to date and an additional $100 per month for dependent children.[4] In many cases, however, survivor's benefits for a spouse without children may only begin at age 55 or 60. South Dakota provides a spouse-only annuity of 40 percent of a member's salary payable only after an unremarried spouse reaches age 65. However, for an additional 1 percent employee contribution during his career, a South Dakota member may purchase a spouse-only benefit which would begin immediately upon his death.[5]

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[1] The Task Force, however, did not define the amount of the additional lump sum death benefit. (*Pension Task Force Report*, 1978, Table 32.) It is also difficult to tell from our sample how often each of these forms of death benefit occurs.

[2] *Report of the Maine State Retirement System*, June 1977.

[3] Again, however, the Task Force Report did not indicate the amount of the benefits nor the service requirements needed to qualify. (Op. cit.) This data is for "teacher" systems only.

[4] Montana Teachers' Retirement System, *Handbook of Information*, Helena, Montana, July 1977.

[5] Connecticut also offers increased survivor's benefits with an additional 1 percent contribution. (Sec. 3-12-105, *South Dakota Retirement Law*, July 1977; Teachers' Retirement Board, *Connecticut State Teachers' Retirement System*, Hartford, Connecticut, 1976 edition.)

OTHER BENEFITS AND PROGRAMS

In addition to retirement, disability and death and survivor's benefits, a teacher retirement system may also offer to its members other benefits such as group life insurance, post-retirement health insurance, a program for purchasing tax-sheltered annuities and provisions for borrowing back contributions an employee has made to the system.

Group Life Insurance

Approximately 20 percent of the systems in our sample (TRS) offer their members coverage in group life insurance programs.[1] In seven of those systems, such as Hawaii, the premiums are paid entirely by the state. On the other hand, the St.Paul system purchases life insurance in the sum of $5,000 for each teacher; the teacher may also purchase up to $15,000 through payroll deductions.[2]

Post-Retirement Health Insurance

Similarly, 20 percent of the systems in our sample (TRS) offer health insurance for their retired members.[3] About 75 percent of these systems provide health care to retirees as an additional retirement benefit and at no cost to the member. In the Ohio plan, health care for a retirant and his spouse is paid by the system, but similar care for dependents must be purchased through deductions from the retirant's monthly allowance.[4]

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[1]Those systems are Colorado; Hawaii; Kansas; Maine; North Carolina; New Jersey; St. Paul; Minnesota; Tennessee; Utah; Virginia; and Washington (National Education Association, *Teacher Retirement Systems*, 1976).

[2]Both examples were cited in National Education Association, *Teacher Retirement Systems*, 1976, pp. 28-29, 139-140.

[3]These systems are: Alaska (1977); Hawaii (1976); Kentucky (1975); Michigan (1977); St. Paul (1975); Minnesota (1978); Ohio (1978); Oklahoma (1978); Oregon (1978); Tennessee (1977); Utah (1977); and Vermont (1977). (The Kentucky and St. Paul examples were cited in National Education Association, *Teacher Retirement Systems*, 1976.)

[4]The State Teachers Retirement System of Ohio, *Ohio Retirement Systems Comprehensive Medical Expense Benefits*, Columbus, Ohio, 1978.

Tax-Sheltered Annuities

A program of tax-sheltered annuities is provided by about 35 percent of teacher retirement systems (PTF).[1] According to many retirement systems, tax-sheltered annuities are not only an additional source of retirement income, they also offer a member possible federal and state "tax-breaks" which makes the program more desirable than conventional savings plans.[2] Tax-sheltered annuities may be regarded more as a form of deferred salary than as a savings plan since an employee's contributions to an annuity fund are deducted *before taxes*. Taxes on those salary deductions are paid only as they are paid out in benefits, therefore reducing an employee's current tax burden. In addition, taxes on annuity contributions and interest thereon are postponed until retirement when an individual will probably be in a lower tax bracket.

Contributions made to an annuities program, which are in addition to the mandatory contributions to the system, are invested by the program and are then returned to the employee at retirement in the form of an additional monthly annuity.[3] The amount of the monthly annuity is actuarially determined at retirement. Since contributions are usually made in the form of voluntary deductions,[4] only active employees may participate in an annuity program. However, previous members may leave their contributions on deposit until retirement. The size of annuity contributions are limited in almost all systems. For example, a Montana teacher may contribute as little as $240 per year, or as much as 12.4 percent of his gross salary.[5] To illustrate how such an

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[1] *Pension Task Force Report*, 1978, Table 34. This figure does not include mixed coverage systems. Only 17 percent of state and local government employee systems offered tax-sheltered annuities to their members.

[2] Montana Teachers' Retirement System, *Handbook of Information*, Helena, Montana, July 1977; State Teachers' Retirement System of California, *Tax-Sheltered and Voluntary Annuity Deposits*, Sacramento, California, January 1978.

[3] If an employee should die before reaching retirement, his accumulated annuity contributions are paid as a lump-sum death benefit to his beneficiary.

[4] The TRS Reports.

[5] Montana Teachers' Retirement System, *Handbook of Information*, Helena, Montana, July 1977.

annuities program can affect the annual allowance of a retired teacher, assume that a Montana teacher retired at age 60 with 25 years credit. He would receive an annual retirement allowance of $6,250. However, if he had accumulated $10,000 in his annuity account, his allowance would be increased to $7,091 per year.

Borrowing

The Pension Task Force estimates that only about 8 percent of teacher retirement systems allow a member to borrow back a portion of his contributions to the system.[1] For example, the New Jersey system allows a member to borrow up to 5 percent of his accumulated contributions if: (1) the member is under 60 years of age; (2) the member has three years of service; (3) the loan is made at the same rate of interest earned if it were invested; and (4) the loan is repaid by retirement age.[2]

SOCIAL SECURITY

In addition to membership in a state or local teacher retirement system, over two-thirds of all teachers (TRS, CB) are covered by Social Security and may receive additional or coordinated benefits at retirement.[3] In most cases, Social Security coverage is offered statewide, although Social Security taxes are most often paid by the school district. As indicated in Table III.4, instead of statewide coverage, several systems offer Social Security membership on a local option basis--

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[1] *Pension Task Force Report*, 1978, Table 34. This data does not include mixed coverage systems.

[2] New Jersey Division of Pensions, *Teachers' Retirement in New Jersey*, Trenton, New Jersey, July 1973.

[3] In some teacher retirement systems, individual teachers may belong to Social Security even though coverage is not offered on a system-wide basis. For example, despite the fact that the California teacher system does not offer coverage, the Census Bureau indicates that two-thirds of the California teachers belong to Social Security. According to California system officials, California teachers receive Social Security coverage for overtime or summer session teaching (which is not credited by the system) or because their spouse is also covered by Social Security. (U.S. Department of Commerce, *Employee Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8; telephone conversation with California system officials, May 3, 1979.)

Table III.4

SOCIAL SECURITY COVERAGE FOR TEACHER RETIREMENT SYSTEMS

Systems (information as of)	Covered: Taxes Paid by	Covered: Extent of Coverage	Covered: Relation to Retirement Allowance
Alabama (1977)	state	statewide	supplemental
Arizona (1978)	NA	statewide	supplemental
Arkansas (1975)	local	statewide	coordinated
Delaware (1977)	state	statewide	NA
Georgia (1975)	local	local option	supplemental
Hawaii (1975)	local	divisional	supplemental
Idaho (1976)	state	statewide	supplemental
Indiana (1977)	state	statewide	coordinated
Iowa (1975)	local	statewide	supplemental
Des Moines, IA (1975)	local	---	supplemental
Kansas (1977)	NA	statewide	supplemental
Maine (1977)	local	local option	supplemental
Maryland (1977)	state	statewide	supplemental
Michigan (1977)	state	statewide	supplemental
Detroit, MI (1978)	NA	NA	NA
Minnesota (1978)	state	statewide	coordinated
Duluth, MN (1977)	local	---	supplemental
Mississippi (1977)	local	statewide	supplemental
Kansas City, MO (1975)	local	---	supplemental
St. Louis, MO (1978)	NA	NA	NA
Montana (1977)	local	local option	supplemental
Nebraska (1975)	local	statewide	supplemental
Omaha, NB (1975)	local	---	coordinated
New Hampshire (1975)	local	statewide	coordinated
New Jersey (1975)	state	statewide	supplemental
New Mexico (1979)	local	local option	supplemental
New York (1978)	local	statewide	supplemental
North Carolina (1975)	state/local	statewide	supplemental
North Dakota (1975)	local	local option	supplemental
Oklahoma (1975)	local	local option	supplemental
Oregon (1975)	local	statewide	supplemental
Portland, OR (1975)	local		NA
Pennsylvania (1975)	state/local	statewide	multiple options
South Carolina (1975)	state	statewide	coordinated
South Dakota (1977)	NA	NA	coordinated
Tennessee (1977)	state	statewide	coordinated
Knoxville, TN (1975)	local	divisional	multiple options
Texas (1975)	local	local option	supplemental
Utah (1977)	local	statewide	supplemental
Vermont (1977)	local	local option	supplemental
Virginia (1978)	state	statewide	coordinated
Washington (1975)	local	statewide	supplemental
West Virginia (1977)	local	local option	supplemental
Wisconsin (1975)	local	local option	supplemental
Milwaukee, WI (1975)	local		supplemental
Wyoming (1978)	NA	NA	NA

Table III.4--(continued)

Not Covered		
Alaska (1977)	Fulton Co., GA (1978)	Minneapolis, MN (1978)
California (1978)	Illinois (1978)	St. Paul, MN (1978)
Colorado (1978)	Chicago, IL (1978)	Missouri (1975)
Denver, CO (1978)	Kentucky (1975)	Nevada (1975)
Connecticut (1978)	Louisiana (1978)	Ohio (1978)
Washington, D.C. (1978)	Massachusetts (1978)	Rhode Island (1975)
Florida (teachers only) (1977)	Boston, MA (1978)	

SOURCE: National Education Association, *Teacher Retirement Systems*, 1976; U.S. Department of Commerce, *Employee-Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8; TRS Reports.

that is, individual school districts may elect to join Social Security. Local option coverage generally results in overwhelming, but not necessarily universal coverage. For example, all but one of the New Mexico school districts elected to join the Social Security system.[1]

The Social Security benefits received by a teacher are usually entirely additional to the benefits provided by a teacher retirement system. However, as Table III-4 indicates, several systems coordinate their benefits with those offered by Social Security. These systems adjust their retirement benefit formulas based on the Social Security contribution base.[2] South Dakota was the only system in our sample which actually offset the benefits a member received from the system based on his Social Security benefits.[3]

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[1] A New Mexico official recently reported that another district was currently trying to drop its Social Security coverage (telephone conversation, May 3, 1979).

[2] This coordination is illustrated in our discussion of step-rate benefit formulas on p. 23.

[3] An illustration of an alternate offset formula used by the South Dakota Retirement System is provided in our discussion of single rate benefit formulas on p. 23. Sec. 3-12-91, *South Dakota Retirement System Law*, Pierre, South Dakota, July 1977.

IV. FUNDING AND FINANCING TEACHER RETIREMENT SYSTEMS

Retirement benefits may be regarded as long-term obligations incurred on behalf of an employee. A teacher retirement system meets those obligations by the two-step process of funding and financing. First, a system adopts a funding plan. A funding plan produces a schedule of monetary payments which are made over a period of time in order to amortize a large debt. A system then finances those payments by collecting contributions from various payors. In the case of TRS, contributions may be made by the state, the school district, and/or the teacher. These two activities, funding and financing, should be considered *separate* exercises since the financed payments may or may not follow the funding plan. How a system determines its chosen funding path and the financial scheme is a complicated process involving many factors, technical calculations, and individual decisions on the part of the retirement system.

Whether the current funding and financing practices of teacher retirement systems are adequate to meet their future benefit obligations is a highly controversial question. In this paper, we will not attempt to judge if the systems are in adequate financial condition, or even how one might decide if they are.[1] Rather, in this chapter we introduce and explain the concepts of retirement system funding and review the current funding and financial practices of teacher retirement systems.

FUNDING CONCEPTS

To Fund or Not to Fund: Current Disbursement Funding

Funding may be broadly defined as an intertemporal schedule of monetary contributions which are made to finance the promised retirement benefits. A retirement system may adopt either of two general approaches to funding its benefit obligation: it may pay for the benefits as they are earned by the employee or it may pay for the benefits as they

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[1] For a discussion of this latter issue, see Richard B. Victor, *The Financial Condition of Teacher Retirement Systems*, R-2517-HEW, The Rand Corporation, forthcoming.

become due. If a system adopts the first approach, it will use what is called actuarial reserve funding. This will be discussed in detail below. If a system chooses the latter approach, it will use current disbursement (or pay-as-you-go) funding in which the employer contributes only enough to meet current operating expenses.

Many arguments have been offered both for and against the use of current disbursement funding in state and local retirement systems. Among other things, proponents argue that pay-as-you-go has the advantage of incurring the lowest initial cost for a system and of eliminating many intricate and costly administrative chores which accompany actuarial reserve funding (e.g., audits, portfolio management, and actuarial valuations). The relative simplicity of current disbursement funding (as opposed to reserve funding in Fig. IV-3) is illustrated in Fig. IV-1 and the heart of that simplicity lies in the absence of the intricate cost calculations which are used in reserve funding.[1] As shown in Fig. IV-1, the annual retirement system cost is determined by adding up its total expenses for any period (e.g., benefit payments to current retirees and administrative costs). The retirement system then collects this amount in contributions from the state, municipality, and/or employees. These contributions flow quickly through the system to cover these expenses. As shown, a minimal pension reserve is usually maintained to ensure that funds will be available for the withdrawal of employee contributions or to pay current benefit payments for two or three years in case of a fiscal emergency. With that exception, no funds are contributed to pay for the future retirement benefits of the current employees. However, adherents of current disbursement funding assert that having large pension reserves to protect the integrity of future benefits is unnecessary and, in some cases, disadvantageous to public systems. Public plans, they argue, are unlikely to terminate, as in the private sector. Therefore, benefits are assured by the continuity of the plan and the power of the government to tax. Furthermore, the funds for a large pension reserve might be more advantageously used in other ways to promote the local economy.

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[1] Reserve funding cost methods are illustrated in Fig. IV-3 and are discussed below.

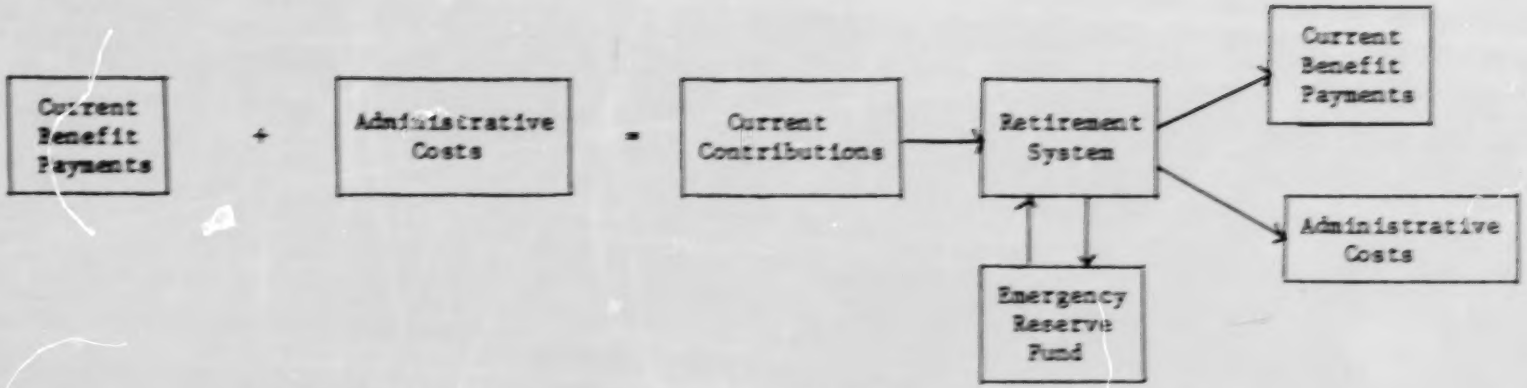

Fig. IV-1—Flow chart of yearly retirement contributions and payments under current disbursement funding

Supporters of reserve funding, on the other hand, maintain that large pension reserves which are properly invested lower the ultimate cost of the system through ever increasing investment earnings. They also claim that pay-as-you-go funding encourages irresponsible benefit increases by passing on part of the increased costs to future generations of taxpayers. Finally, the time path of costs which results from current disbursement funding puts an increasingly heavy burden on the state, municipalities, and individual school districts.

Fig. IV-2 illustrates how this payment burden develops. A pay-as-you-go system requires a small initial cash outflow early in the life of the system. However, costs increase sharply as more and more employees retire. Theoretically, costs begin to level out as the labor force stabilizes and as the number of pensioners dying equals the number of new pensioners retiring. If the labor force continues to grow, salaries rise or benefits are improved, this leveling off is postponed with annual obligations continuing to grow.

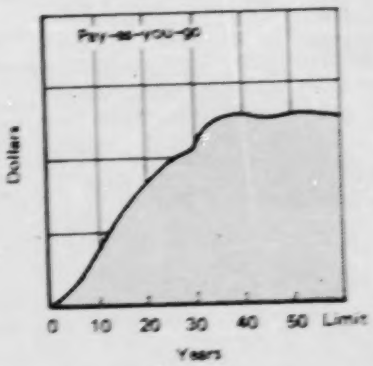

Fig. IV-2 — The time path of retirement system costs under pay-as-you-go funding with a stable labor force [a]

[a] This illustration assumes a stable labor force distributed from age 30 to 64. This group is assumed to be replenished by new entrants each year, with no retired persons initially. Robert Tilove, *Public Employee Pension Funds*, Columbia University Press, New York, 1976, p. 146.

Reserve Funding

The alternative to current disbursement funding is actuarial reserve funding in which a TRS systematically accumulates a pool of funds during an employee's career which is then used to help pay for his promised benefits after retirement. However, there is no single correct method of reserve funding. A system not only makes a decision to fund; it also chooses a funding method and a level of funding based upon the size of the pension reserve it wishes to accumulate and the desired time path of payments it prefers to make.

The details of actuarial calculations and the differences between various cost methods and reserve funding methods are technically complex and laden with professional actuarial jargon. What follows below is a discussion of the most common funding methods used by teacher retirement systems. This discussion emphasizes simplicity and minimizes the use of jargon. For a more technical discussion of actuarial funding, we refer the reader to a comprehensive text.[1]

There are, however, five terms which are central to any discussion of reserve funding: the actuarial cost method, the funding method, actuarial assumptions, normal cost, and the supplemental liability. How these five elements interrelate to produce a retirement system's funding plan is extraordinarily complicated. Yet this relationship is vital to understanding the fundamentals of reserve funding and the financial decisions which must be made by a system. Fig. IV-3 presents a simple schematic drawing of the interrelationship of those five funding elements and we suggest that the reader refer to this figure often during the following discussion.

Cost Methods

A system of actuarial reserve funding begins with an estimate of the total future obligations of the retirement system; that is, the total retirement benefits that the system will owe its present members. In

[1] See, for example, C. L. Trowbridge and C. E. Farr, *The Theory and Practice of Pension Funding*, Richard D. Irwin, Inc., Homewood, Illinois, 1976 or Dan M. McGill, *Fundamentals of Private Pensions*, Richard D. Irwin, Inc., Homewood, Illinois, 1975.

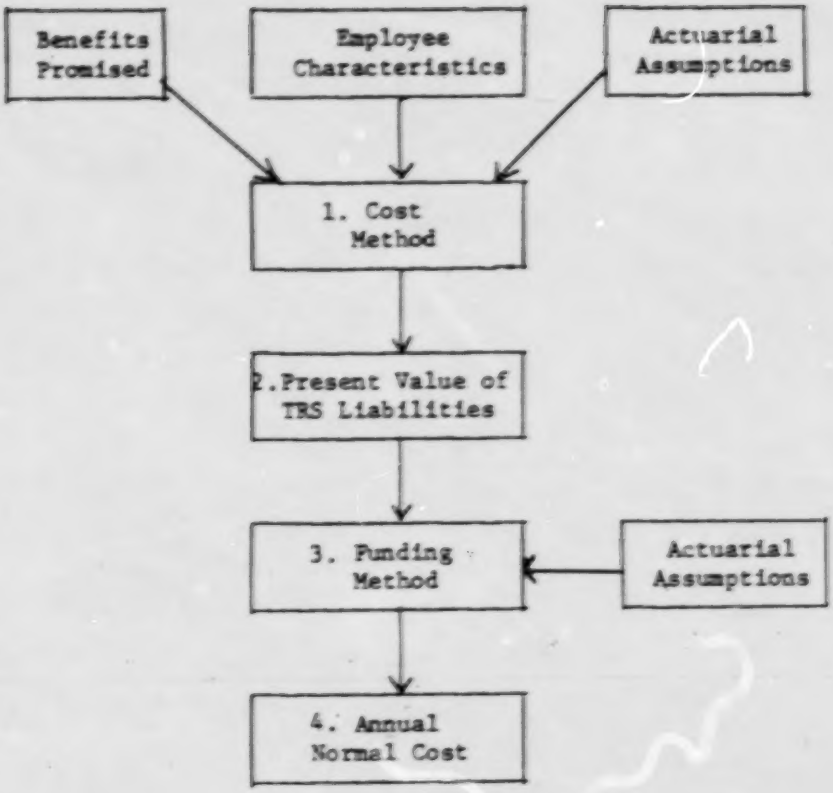

Fig. IV-3—Flow chart of annual TRS cost calcualtion under reserve funding

general, there are two approaches to cost estimation: actuarial cost estimates may be based on those benefits already *accrued* by the employees or based on the *probable or projected* benefits that employees will earn during their career. If a system adopts the former approach, it will use an "accrued benefit" approach to funding. However, since this approach is not currently used in teacher retirement systems, we will not deal with it in this chapter. Instead, the reader is referred to a short discussion of the accrued benefit approach in Appendix B.

If the retirement system chooses the *projected cost method*, it will finance its pension costs based on the benefits that members are *likely* to earn during the course of their careers. In order to make

these cost estimates, the actuary[1] must have three sets of information as shown in Fig. IV-3:

1. The retirement benefits promised to each member based on the provisions of the system's benefit package;
2. Characteristics of the members; e.g., age, sex, number; and
3. A series of actuarial assumptions about probable future events (e.g., the probability that an employee will continue service until retirement age or will qualify for a vested retirement benefit, the likely length of the retirement period, etc.)

The actuary applies these assumptions to the characteristics of the system's members through a series of mathematical calculations. This procedure results in an estimate of the total retirement benefits that the system will owe its present members. As shown in the second box in Fig. IV-3, the cost of the system benefits is then converted to its present value--or the amount of funds presently required to fund any prospective annuity.[2]

Actuarial Assumptions. The first two sets of information which are needed for the cost estimates are relatively easy to obtain. The employee characteristics are available from a census of the membership and the benefits to which the members are entitled are outlined by law. However, accurate actuarial assumptions are often difficult to formulate and therefore deserve special attention. Some assumptions, such as mortality rates, may be derived from standard tables. Other assumptions, such as turnover rates and retirement rates, may be more system-specific and, therefore, more difficult to estimate. In some cases, these predictions may be systematically derived from the system's experience; at the other extreme, they may reflect the actuary's or system director's best guess about the future.

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[1] An actuary is a professional expert in pension and life insurance matters, trained in insurance probabilities, and mathematical, statistical, and accounting methods.

[2] Present value assumes that the funds will be invested and that the accumulated earnings will be added to the reserve.

It is perhaps one of the most frustrating aspects of pension funding that actuarial assumptions, which are so difficult to accurately estimate, are at least as important as the funding method and benefit formula in determining the ultimate system costs and how those costs are distributed over the life of the system. If the assumptions are too conservative, future costs will be overestimated and more funds will be contributed than are necessary and a greater proportion of the costs will be funded in the early years of the system. On the other hand, if the assumptions are too liberal, future costs will be underestimated, insufficient funds will be contributed creating actuarial losses[1] and more of the cost burden will be shifted to the future generations of taxpayers. The typical actuarial assumptions used by an actuary to estimate the total system costs are listed below.

- *Pre-retirement mortality rates* predict the likelihood of a member dying before reaching retirement age. Unless the system offers survivor's benefits, the higher the actual pre-retirement mortality rate, the fewer retirement retirees expected to receive benefits and the lower will be benefit costs.
- *Post-retirement mortality rates* estimate how long a pensioner is likely to live past retirement age. The lower the post-retirement mortality rate, the longer retirees can expect to collect benefits and the higher is the total system cost.
- *Disability rates* predict how many members are likely to be disabled before reaching retirement age. If the system offers disability coverage, the higher the disability rate, the higher the total cost. If disability benefits are not offered, lower costs will be associated with higher disability rates.
- *Turnover rates* forecast how many employees are likely to terminate before reaching retirement age or quality for a deferred retirement benefit. The more members who withdraw from the system, the lower the total retirement costs since fewer members

[1] Actuarial losses occur when the cost estimates fall short of the actual funding requirements.

will eventually receive a retirement allowance, or will receive lower benefits based on fewer service credits.

- o *Retirement rates* predict how early a pensioner is likely to retire. Earlier retirements tend to lower costs since the retirement allowances are based on a lower salary base and fewer years of service; however, early retirements mean longer benefit payment periods, which are associated with higher costs.
- o *Salary increases* project the eventual level of a retiree's salary base. Since a higher salary base will result in a higher retirement allowance, the rate of change of salary will be positively related to a system's pension cost.
- o If a system offers survivor's benefits, an assumption concerning *marital status and the number of dependents* may also be used.

The accuracy of the actuarial assumptions used in the retirement cost calculation and how it affects the distribution of system costs over time will be discussed below.

Funding Methods

Once the present value of the retirement system's liabilities (or total benefit obligations) has been calculated (see Box 2, Fig. IV-3), a *funding method* (Box 3) is used to systematically distribute the costs over some time period. The *normal cost* (Box 4) is defined as that portion of the benefit costs which has been allocated to a single year. For simplicity's sake, normal cost is much like mortgage payments on a house. It is the annual payment required of the system for the amortizing of the total cost of benefits. It is typically expressed as a level dollar amount or level percentage of payroll, but it need not be.

As shown in Fig. IV-3, for total retirement costs to be distributed by means of the funding method, additional actuarial assumptions are needed for the calculations. They are:

- o *Rate of interest earnings* predicts the expected interest earnings on invested pension reserves. With higher interest on

contributions, smaller contributions need be forthcoming to fund a given pension in the future.

- o *Growth in underlying labor force* is a particularly important assumption for teacher retirement systems facing an era of declining enrollments. An unanticipated shrinking labor force (system membership) means higher normal costs for systems using aggregate funding methods as future payrolls decline. Of course, the reverse is true for systems that grow faster than anticipated.[1]

While there are a myriad of funding methods that may be used by teacher retirement systems, they generally fall into two categories: Entry Age Normal, which is an individual method, and the Traditional Aggregate method.

Entry Age Normal Method. Entry Age Normal Method funding is the most common individual projected funding method. In Entry Age Normal, as each teacher enters the system, total projected retirement benefits are actuarially estimated and allocated as a *level* percent of payroll annually contributed over the expected length of his career. The sum of these individual contributions across all individuals in a given year equals the total normal cost for the system. The Entry Age Normal method--barring radical benefit changes--results in a level contribution time path throughout the career of the individual teacher and throughout the life of the system, given a mature, stable labor force and a fully funded system.[2]

Aggregate Method. Aggregate funding methods, like Entry Age Normal, estimate system costs based on projected benefits. While individual methods calculate the normal cost as the sum of a myriad of individual benefit cost streams, aggregate methods figure the normal cost based on the total benefits in aggregate owed by the system. This distinction leads to differences in how the normal cost is determined. In

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[1]The effect of this assumption becomes clearer in our discussion of Aggregate funding methods.

[2]See Fig. IV-5 for an illustration of the time path of system costs under Entry Age Normal, within our discussion of the effect of supplemental liabilities.

the Traditional Aggregate method, the total annual funding requirement is figured by computing total future benefits owed by the system minus the accumulated system assets. The normal cost is calculated by distributing this remaining amount as a level annual percentage of all future system payrolls.[1] As shown in Fig. IV-4, the Aggregate method results in very high contributions during the early years of the system when there are fewer assets. Therefore, aggregate funding methods in general build up pension reserves faster than most other methods. However, as the system matures and assets are accumulated, the contribution level steadily decreases in a stable, fully funded system.

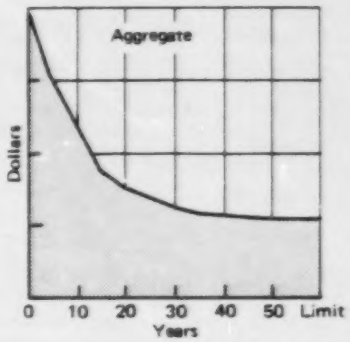

Fig. IV-4--The time path of retirement system costs under the Traditional Aggregate funding[a] method with a stable labor force.

[a]This illustration assumes a stable labor force distributed from age 30 to 64. This group is assumed to be replenished by new entrants each year, with no retired persons initially. Robert Tilove, ibid., p. 146-147.

Supplemental Liabilities

To review reserve funding thus far, a retirement system calculates the present value of its total future costs. It then distributes this lump sum over time into yearly payments (normal costs) through its

[1]Since the normal cost is recalculated each year under Aggregate funding, the actual level of the normal cost contribution may vary from year to year.

funding method. In theory then, if the actuary's cost calculations are correct and if the system's annual contributions equal the annual normal cost, the system will be "fully funded." However, what if the annual contributions fall short of normal costs or the actuary's estimates are wrong or the total obligations of the system increase without a corresponding change in the normal cost? In these cases, a supplemental liability would be created.[1]

The supplemental liability may be broadly defined as that portion of a system's costs which has already been accrued (under its funding method) but have not yet been financed by the system--that is, the accrued benefits less the assets of the system equal the supplemental liability. A supplemental liability may arise in several ways:

- o If the system does not pay the full annual normal cost, the unfunded portion creates or adds to the supplemental liability.
- o If benefits accrue to teachers on the basis of service credits earned before the initiation of the plan ("prior" service credits), supplemental liabilities are usually created.
- o It may be increased through retroactive benefit improvements without expensive current full funding of these improvements.
- o A supplemental liability may be created or increased through actuarial losses.[2]

For example, given recent experience with teacher salary gains, a 3 percent salary increase assumption is likely to significantly underestimate the ultimate salary base of retiring employees, therefore underestimating the funds needed to finance retirement benefits, e.g., the normal cost. This shortfall of funds, or actuarial loss, will create or

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[1]Pension actuaries have other common expressions for this term. They refer to it as the "past service liabilities," "prior service liability," or "unfunded accrued liability." The latter was at one time widely used in pension literature. It was recently discarded by some authors who contended that the term "unfunded liability" was misleading since many funding methods did not intend to ever fund this deficiency.

[2]Similarly, the supplemental liability may be reduced through an actuarial gain.

increase the system's supplemental liability, and may therefore transfer some of the costs to future generations.

ERISA requires private sector systems to amortize or pay off a supplemental liability within a stated time period, generally 30 to 40 years. However, no such requirements exist for public retirement systems. Teacher systems may treat a supplemental liability in many ways, depending upon the funding policy of the individual system. Some systems choose to amortize the liability over a 20- to 40-year period, much as a person might pay off the mortgage on a house. Others "freeze" the supplemental liability and make payments only sufficient to offset actuarial losses, benefit improvements, and accumulating interest on the funding shortfall. Still others ignore the supplemental liability, implicitly watching it grow as foregone interest accumulates.

The illustrations below in Fig. IV-5 demonstrate how the existence and amortization of a supplemental liability affects the intertemporal distribution of system costs under Entry Age Normal funding. In the first illustration, the full normal cost is paid, but only interest is paid toward the supplemental liability. This prevents the supplemental liability from increasing.[1] If a system chooses to amortize the supplemental liability as in the second illustration, it would result in high contribution levels early in the life of the system, and a drastic drop in contributions after the liability is paid.

The existence of a supplemental liability has spawned a different type of aggregate funding method, as well. The Frozen Initial Liability method differs from the Traditional method in its treatment of the supplemental liability. In the Traditional Aggregate method the supplemental liability is included in the total benefit costs and is therefore amortized over the life of the system. In the Frozen Liability method, the supplemental liability is not funded. Instead, the supplemental liability is subtracted from the total system obligations *before* the costs are distributed over the life of the system. Thus, it is "frozen" or maintained at current levels.[2] In general, the Frozen Initial Liability method

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[1] A fully funded entry age normal system would also have this time path of costs, although at a lower level of costs.

[2] Presumably, the system contributes funds to offset the accruing interest on the supplemental liability.

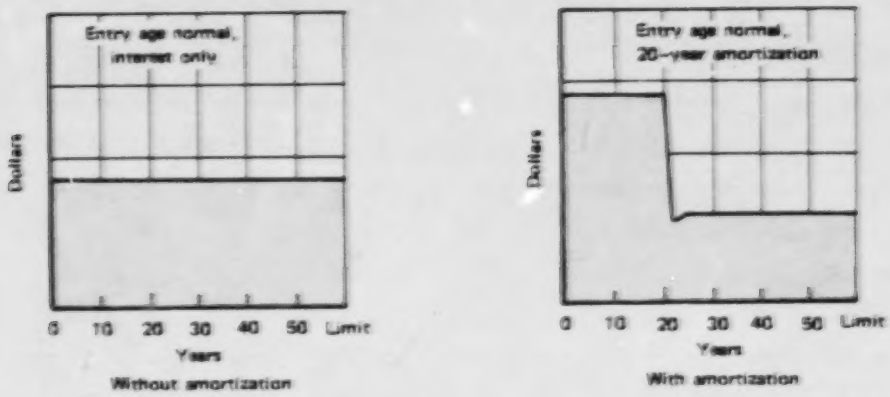

Fig. IV-5 — The time path of retirement system costs under Entry Age Normal funding with a stable labor force, with and without amotization of the supplemental liability [a]

[a] This illustration assumes a stable labor force distributed from age 30 to 64. This group is assumed to be replenished by new entrants each year, with no retired persons initially. Robert Tilove, ibid., pp. 146-147.

would result in a time path of costs similar to that of the Traditional method, but the contributions would be lower overall, in a mature, stable system.

FUNDING PRACTICES OF TEACHER RETIREMENT SYSTEMS

In this chapter we briefly outlined the fundamentals of retirement system funding in general and reserve funding in particular. We now review the actual funding practices of teacher retirement systems along with a cursory examination of the actuarial assumptions used and the funding levels maintained by the systems. As we stated earlier, however, we in no way attempt to judge the adequacy of those funding practices.

Funding Methods Used by Teacher Retirement Systems

According to the Pension Task Force Report, less than 10 percent of all teacher retirement systems use a current disbursement or pay-as-you-go funding method. Massachusetts, for example, adopted pay-as-you-go funding in 1948, and continues to use this method. Some systems

maintain current disbursement funding because it is difficult to quickly switch to actuarial reserve funding. The 1978 valuation report of the Indiana state system recommended a four-year phase-out of the system's current disbursement funding to actuarial funding including the 40-year amortization of the system's supplemental liability. If the system adopted this new funding schedule, the employer contribution required would nearly double during the four-year phase in, ultimately resulting in an additional $50 million annually in contributions. As the Indiana actuary stated, such a funding increase was "an awesome prospect."[1]

Of the 90 percent of TRS using actuarial reserve funding, the Entry Age Normal method is particularly popular, probably due to its characteristic of level individual costs. In the TRS sample, over three-quarters of the systems which provided actuarial information use Entry Age Normal. Almost a quarter of the systems use some form of aggregate funding.

Actuarial Assumptions Used by Teacher Retirement Systems

Based on the TRS sample and published information, it is difficult to generalize about the accuracy of the actuarial assumptions used by teacher retirement systems. However, the interest earning assumption demonstrates how widely assumptions may vary across systems. Subject to portfolio restrictions, each system invests its assets in a national securities market which should lead to roughly comparable rates of return. However, in our sample (TRS), the interest rate assumptions ranged from 5 percent in the Chicago system to 7.5 percent in the California system.[2] This variation becomes significant in light of a rule of thumb concerning interest earnings: each 1 percent change in the rate of investment earnings has a 24 percent effect in the opposite direction on the required rate of contribution.[3] Therefore, an

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[1] Indiana State Teachers' Retirement Fund, *Annual Report*, Indianapolis, Indiana, 1978.

[2] Public School Teachers' Pension and Retirement Fund of Chicago, *Eighty-Second Annual Report*, Chicago, Illinois, 1977; State Teachers' Retirement System of California, *Sixty-Fourth Annual Report*, Sacramento, California, 1977.

[3] C. L. Trowbridge and C. E. Farr, *The Theory and Practice of Pension Funding*, Richard D. Irwin, Inc., Homewood, Illinois, 1976, p. 79.

unrealistically low interest earning assumption will significantly overestimate the contributions required and will redistribute costs to the earlier funding years.

Funding Levels Maintained by Teacher Retirement Systems

Once the actuary determines the recommended normal cost in the private sector, full normal cost is generally contributed to the system. This rarely occurs in public systems. The actual amount of funds contributed to a system is determined not solely by the actuary's recommendations, but in a political process involving many actors and interests. These actors may include the Governor's office, state finance officials, the state legislature which sets benefit levels, and legislative authorizing and appropriating committees. Local government officials who determine local budgets may also make contributions to the system.

We know very little about how actual funding levels are determined within this political process; however, from our sample (TRS), we can state that *the funds contributed to a system tend not to coincide with the levels recommended by the actuary*. Table IV-1 illustrates the recommended versus actual contributions for the systems in the TRS sample for which we had adequate actuarial and financial information. Although some systems such as Texas and Montana contribute very nearly the amount recommended by the actuary, most systems either overcontribute or the contributions fall significantly short of the required levels. Those systems that overcontribute tend to exceed the recommended amount by about 17 percent. However, as the table indicates, if a system undercontributes, its contributions are likely to fall short of the recommended level by about 30 percent. For example, California's actual employer contribution in 1977 was 45 percent less than the recommended level.[1] The teacher division of the Rhode Island retirement system also contributes substantially less than the actual funding requirement. According to the state's statutory financing schedule, in 1978, the state and municipalities were required

[1]State Teachers' Retirement System of California, *Sixty-fourth Annual Report*, Sacramento, California, 1977.

Table VI-1

SAMPLED TRS: RECOMMENDED EMPLOYER CONTRIBUTION RATES
AND ACTUAL EMPLOYER CONTRIBUTIONS
(% of payroll)

System	Recommended Employer* (%) Contribution	Actual Employer (%) Contribution	Year of Report
Alaska	13.06	14.18	1976-77
Arizona	5.77	7.00	1975
California	18.55*	approx 10.00	1977
Denver, CO	9.97	8.90	1978**
Colorado	12.10	12.30	1976
Hawaii	13.75	14.20	1976
Idaho	10.06	7.30	1977**
Chicago, ILL	19.90	approx 13.30	1977**
Indiana	14.91	7.60	1977
Iowa	3.59	5.25	1977
Kansas	5.30	7.30	1977**
Louisiana	14.93	8.26	1977**
Maine	10.29	NA	1977
Maryland	6.13	NA	1976
Montana	6.30	6.20	1977**
New Hampshire	2.88% + $335,134 for UFL ***	NA	1975
North Dakota	5.33	4.00	1976**
Rhode Island	20.10	7.60	1977**
Texas	6.00	6.00	1977
Vermont	5.26	approx 6.00	1976
Washington	13.32	13.20	1976**
Milwaukee, WI	5.1% + $3.6 million for UFL ***	NA	1977

* If a choice of rates was offered, the rate in this table results in 30-year amortization of the supplemental liability.

** Actual contribution figures are from the year preceding or the same year as the actuarial report. Employer contributions may have been later adjusted in accordance with the actuary's recommendations.

*** UFL = unfunded or supplemental liability.

to contribute 7.6 percent of payroll. However, the actuarial valuation of 1977 found that the actual norm cost to employees was 20.1 percent of payroll.[1] If the annual cost is not fully financed each year, a greater burden of the pension costs will be shifted to later years in the form of an increased supplemental liability. In general, how the contributions to a teacher retirement system are determined within the political process is a complex and important question requiring further investigation.

Financing Teacher Retirement System Costs

Once the level of funding has been established, the costs of a teacher retirement system are financed by investment earnings and contributions from three potential payors: the state government, local school districts, and the system members.

The Apportionment of Retirement System Cost. In most teacher retirement systems, a portion of the system cost is financed by mandatory member contributions. The average teacher contributes 5 or 6 percent of his gross annual salary to a retirement system, although contributions may range from 3 to almost 10 percent of salary. The overwhelming majority of teacher systems (TRS) determine the annual contribution for all members as a flat-percentage of salary. Systems with higher contribution requirements tend to determine member contributions on an individual basis. The New Jersey system fixes an individual's annual contribution based on actuarial cost estimates of that individual's projected benefits. This results in contribution levels of 4.8 to 8.4 percent of salary for male teachers and up to 9.5 percent of salary for female teachers in New Jersey.[2]

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[1]The Rhode Island funding schedule requires the state and municipalities to pay only a portion of the actual employer contributions. This portion increases each year until 1985 when the employer will begin to fully pay the annual normal cost and amortization payment. However, in the 1977 valuation, it was recommended that the system adopt a stricter funding schedule. Employees Retirement System of the State of Rhode Island, *Annual Report*, Providence, Rhode Island, 1977.

[2]New Jersey Division of Pensions, *Teachers' Retirement in New Jersey*, Trenton, New Jersey, 1973.

There has been a recent trend in teacher system financing to eliminate mandatory member contributions and finance the system costs solely through state and local government contributions. "Non-contributory" financing, of course, places a greater financial burden on state and local governments than do financing schemes which include member contributions. It also results in the highest employer contribution levels of all teacher retirement systems. The New York State teacher system switched to non-contributory financing in 1968 and, since 1975, both Michigan and Florida established non-contributory systems. The contribution rate in 1977 for the New York system was nearly 20 percent versus about 8 percent for the average system.[1] However, the Florida noncontributory system contributed only 9 percent of salary for each employee in 1977.[2]

Employer contributions to a retirement system are paid by the school district, the state (either from the state general fund or special appropriations) or, in some cases, the burden is shared by both the state and the school districts. Of the state systems in the TRS sample, an equal number (about 40 percent) were financed either by the school districts or by the state. The remaining 20 percent of state systems (TRS) divided the cost between the two sources, although not always equally. The Rhode Island system, for example, splits the cost burden evenly between the state and municipalities.[3] However, in the New Hampshire plan, the school districts are responsible for 60 percent of the contribution while the state pays the rest.[4] Over half the

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[1] New York State Teachers' Retirement System, *Administrative Bulletin to Chief School Administrators and Presidents of State University Colleges and Community Colleges Regarding Employer Rate of Contribution to the Retirement System for the School Year 1977-78*, Administrative Bulletin No. 7-5, July 29, 1977.

[2] This contribution was increased to 9.2 percent in 1978. State of Florida Department of Administration, *Annual Report*, Division of Retirement, Tallahassee, Florida, 1977.

[3] National Education Association, *Teacher Retirement Systems*, 1976.

[4] Ibid.

local teacher systems (NEA) are financed by the school district and employees alone; the remainder receive funds from both the state and the local governments.[1]

The level of the employer contributions may be fixed by statute, determined annually by the state legislature through special appropriations, or set by an actuary through an annual calculation of the financial needs of the system. In nearly 40 percent of the systems in the TRS sample, the level of the employer contribution is determined by statute and is collected as a flat percentage of payroll. Flat percentage rates may be as low as 4 percent of payroll, as in Minnesota, but usually range between 6 to 9 percent of payroll.[2] For example, the South Dakota school districts, mandated by statute, contribute 8 percent of payroll to the retirement system.[3] An equal number of systems in the TRS sample determined employer contributions actuarially, based on annual valuations. The National Education Association report found that many local systems actuarially determine the employer contribution.[4] A typical example is the Colorado system which contributed 12.10 percent of payroll in 1977.[5] Not surprisingly, actuarially determined contributions, with average levels of 12 to 14 percent of payroll, tend to be higher than levels which are set by statute. This difference in contribution levels may suggest that statutorally set contributions may lag actual changes and increases in retirement system costs.

In the remaining 10 percent of the TRS sampled systems, the employer contribution is provided and, in some cases, determined by special legislative appropriations. The level of contributions required in these systems may be determined in several ways. Systems which are

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[1] U.S. Department of Commerce, *Employee Retirement Systems of State and Local Governments*, Bureau of the Census, Vol. 6, No. 1, September 1978, Table 8.

[2] Teachers Retirement System of the State of Minnesota, *Forty-sixth Annual Report of the Board of Trustees*, St. Paul, Minnesota, 1977.

[3] *South Dakota Retirement System Law*, July 1, 1977.

[4] National Education Association, *Teacher Retirement Systems*. 1976.

[5] The Public Employees' Retirement Association of Colorado, *Annual Report*, Denver, Colorado, January 1978.

dependent upon state appropriations often determine the level of required financing based on non-actuarial methods. For example, current disbursement funding methods determine the employer contributions based on annual expenses. Some systems "match" the employer contribution in some way to the annual member contribution. These usually rely upon legislative appropriations. However, several systems receive legislative appropriations along with the regular contributions from the local school districts. In 1977, the Illinois State system received a total of $157 million from three separate appropriations in addition to the 10.5 percent payroll contribution received from the local districts.[1]

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[1] Teachers' Retirement System of the State of Illinois, *1977 Annual Report*, Springfield, Illinois, 1977, p. 7.

V. THE ADMINISTRATION OF TEACHER RETIREMENT SYSTEMS

The administrative structure and operation of teacher retirement systems may be the most difficult aspect to outline from published information, and may best be studied using case study method. While from published data we are not able to generalize about retirement system operations, we do illustrate the most common administrative structures and practices in use by teacher retirement systems and suggest issues surrounding retirement system administration which need further study.

One issue which deserves further research is the relationship between the system administration and the various governmental agencies and interest groups which may influence benefit funding and financing decisions. The intergovernmental relationships extend far beyond the simple interaction between a state government and a state system or a local system and a school district or municipality. A state system may also deal with the state legislative authorizing committees that set benefit levels; appropriation committees which appropriate funds for the system; state finance committees which oversee the system's financial condition; local school districts which contribute to the system and state teachers' organizations for both active and retired employees. Local systems must interface with a similar list of interested parties. In the case of local systems, however, the list may be complicated by a division between the state legislature which sets benefit levels and the local government which is required to finance those benefits. The precise nature of these relationships is unclear. Because of the importance of the decisionmaking process to ultimate fiscal responsibility, these intergovernmental relationships should be investigated.

ADMINISTRATIVE STRUCTURE

Depending upon the size and the complexity of the system, the administrative guidance for a large teacher retirement system includes

government officials, professional administrators, private citizens, technical and financial advisors, and members of the retirement system itself. For example, the administrative structure of the Virginia Supplemental Retirement System includes a nine-person board of trustees (four state officials, three members of the general public, and two retirement system members), a system director, a three-person medical board, consulting actuaries, six financial and investment advisors, and legal counsel.[1]

Fig. 1 below illustrates administrative structure for most teacher retirement systems. The typical system's administration is headed by a board of trustees or retirement board which is vested with ultimate decisionmaking authority. The system director is appointed by the board to carry out its policies and decisions and to act as the system's operational administrator. Consequently, the staff is hired by and responsible to the director. Outside financial advisors and consultants such as auditors and actuaries are formally responsible to the board of trustees. However, in some systems, the director may have more interaction with consultants and therefore may exert more influence than individual trustees. The lines of authority and the interaction between these administrative levels are functions of internal policies, the allocation of responsibilities within an individual system, and individual personalities and styles.

Board of Trustees

In most teacher retirement systems, the responsibility for policy, budgetary, and investment decisions is legally vested in a board of trustees. The Virginia system board includes nine members, although boards may range in size from five to fourteen members. The larger boards are generally found in (1) general coverage systems which must represent a number of occupational groups, and (2) systems which delegate greater operational responsibility (e.g., investment decisionmaking) to the boards. The Oklahoma board of trustees, for example, has full

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[1] Virginia Supplemental Retirement System, *1977 Annual Report*, Richmond, Virginia, October 1977.

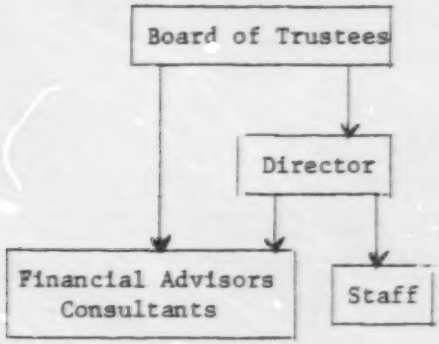

Fig. 1--General administrative structure of teacher retirement systems

investment authority and therefore augments its five member board with four additional outside financial advisors.[1]

Although the exact composition of the board of trustees varies considerably from system to system, board members are normally drawn from three groups: the employer (i.e., state or local officials), the active and retired employees and, in most systems, the public members. Many observers believe that the degree of influence that the membership can exert over system management may depend on the number of teachers and other employees included in the board of trustees.

While nearly all boards (NEA) include at least one member-trustee, in most state systems, employee representatives number less than half of the board members. In addition, most member-trustees are not elected by the system membership but are instead appointed by the governor. For example, three of the five members of the Oregon Public Employee Board of Trustees are employees; however, those members were appointed by the governor rather than elected by the membership.[2] Retirement system members appear to have greater board representation in local plans. In approximately 75 percent of local boards, teachers and other employees number at least half of the board membership and are elected to their positions. For instance, two-thirds of the Chicago Teacher

[1]Teachers' Retirement System of Oklahoma. *Rules and Procedures*, Oklahoma City, Oklahoma, August 1978.

[2]National Education Association, *Teacher Retirement Systems*, 1976.

System trustees are elected from the membership and in the Portland, Oregon Retirement Board, all seven board members are employees.[1]

As the influence of teacher organizations grows, control of the board of trustees by either the employer (i.e., government officials) or by the employees (i.e., teachers and other employees) becomes a particularly important issue. Bleakney (1972) suggests that as teacher organizations become more established, employer and employee trustees will be increasingly expected to serve as spokesmen for their respective interests in the policy decisions made by the board. Some observers predict not only greater equalization in board representation of the two parties, but also a growing trend toward the election of member-trustees by the system membership rather than appointment by an elected government official. A result could be greater partisanship in making teacher retirement system decisions.

The legislation establishing the system determines the number of member-trustees to sit on the board and in some cases, the qualifications required. Especially in state plans covering many classifications of public employees, care is often taken to balance board representation among member groups. In the New Hampshire Retirement System which covers four separate occupational divisions--firemen, state and municipal employees, teachers, and policemen--the board must include two members from each division.[2] Many statewide teacher retirement plans require board representation from all levels of the school system. Of the seven-member trustees in the Alabama Teacher Retirement System, one must be a superintendent of schools, one a post-secondary instructor, one a principal, three must be classroom teachers and, as in many systems, one must be a retired teacher.[3] Some boards have even more specific membership requirements to ensure representation of all constituencies.

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[1] In the Des Moines Teacher System, on the other hand, the Board of Education also serves as the retirement system board (National Education Association, *Teacher Retirement Systems*, 1976).

[2] *New Hampshire Retirement System*, Chapter 100-A: 14.

[3] Teachers' Retirement System of Alabama, *Questions and Answers*, Montgomery, Alabama, October 1977; and National Education Association, Ibid.

For example, the North Dakota board must include one female and the Teacher Retirement System of Arkansas provides for one "non-Caucasian" trustee.[1] While Arizona requires all member-trustees to have previous administrative experience, most systems have no specific prerequisites for board membership and members serve without compensation.[2]

One-third to one-half of the board trustees are typically state and local government elected officials serving ex officio. In some instances, the governor, state superintendent of schools, or state treasurer is designated as board chairman; in others, the chairman is elected by the board.[3] About half of the retirement system boards include at least one elected official with financial experience. The employer representatives in the West Virginia Teacher Retirement System include the governor, the state treasurer, the state school superintendent, the state commissioner for finance and administration, and the state insurance commissioner.[4]

The practice of automatically including elected officials on a retirement board simply by virtue of their office recently has received some criticism. As Bleakney states: "The objection raised is that the ex officio member of the board does not necessarily have the background, qualifications, or, for that matter, interest, to serve well on the board."[5] This criticism, if valid, could prove to be a significant problem for systems administered principally by elected officials. The South Carolina system, for example, is administered by a State

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[1]North Dakota Teachers Fund for Retirement, *Public School Teacher Handbook*, North Dakota, January 1978; Arkansas Teacher Retirement System, *Handbook of Information*, Little Rock, Arkansas, 1977.

[2]National Education Association, *Teacher Retirement Systems*, 1976.

[3]Ibid.

[4]The West Virginia Board also includes two classroom teachers and two university instructors. (The West Virginia Teachers Retirement Board, *Thirty-Sixth Annual Report*, Charleston, West Virginia, September 1977.)

[5]Bleakney, p. 149.

Budget and Control Board composed solely of five government officials serving ex officio.[1] Such an indictment, of course, cannot apply to an entire class of administrators; any judgment as to interest or competence must be made on an individual basis.

Public representation on state teacher retirement system boards is common and all appointments are made by the governor.[2] There are two types of outside board members: financial advisors and members of the general public. The former bring important technical expertise to board deliberations; the latter represent the interests of the community at large. Twenty percent of retirement systems require the appointment of an outside investment advisor, such as a local banker or insurance counselor.[3] Generally, financial advisors are included as members if the board retains some direct control over the retirement funds. Members of the general public are required on a quarter of all teacher retirement system boards.[4]

Scope of Authority. In nearly all retirement systems, the board is legally vested with the ultimate policy and administrative authority.[5] Some boards take a fairly active role in the operation and policy decisions of the retirement system. The duties of a board of trustees may be narrowly or broadly defined by statute. Alternatively, it may be left to the board to determine how active or passive a role it wishes to take in the administration of the system. In some cases, a board may hire and confer with consultant staff, make legislative recommendations, make investment and budgetary decisions, and preside over benefit hearings. However, in most large systems, the board delegates many of its duties and the responsibility for the day-to-day operation of the system to a director.

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[1] National Education Association, *Teacher Retirement Systems*, 1976.

[2] From the published information it is difficult to generalize about public representation on local boards, although it appears to occur less frequently than in state boards. National Education Association, 1960.

[3] Ibid.

[4] Ibid.

[5] *Pension Task Force Report*, Table 7.

System Director

In theory, the power of the director is derived from the board. Not surprisingly, observers believe that the director has great discretionary authority and influence. The director acts as spokesman for the system in any dealings that it might have with the legislature or membership and he directs the day-to-day operation of the staff.[1]

Technical and Advisory Staff

Along with the administrative and clerical personnel, the staff of the retirement system may also include an array of consultants and technical advisors, such as auditors, accountants, actuaries, investment counselors, and physicians[2] who are generally hired on a consultant basis. However, the larger retirement systems may hire technical specialists such as auditors and accountants as full-time staff.

ADMINISTRATIVE FUNCTIONS

Although the functions performed internal to the individual systems may vary considerably according to the benefits and services offered to the members (such as annuities, loans, or group life insurance), several administrative functions are generally accepted as necessary to the proper management of the retirement system. These include the management of the system's assets, communication with system members, disclosure of individual account information, and the responsibility for the system's financial condition through regular audits and actuarial valuations.

The Management of System Assets

Since the size of the fund and the interest earned on investments affects benefit and contribution levels, the effective management of a system's assets is considered a primary administrative objective. Systems vary in how they make investment decisions and in which parties participate in the decisionmaking process.

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[1] Bleakney, pp. 148-159.

[2] Medical consultants or, in larger systems, medical panels advise the board concerning disability cases.

Investment Decisions. The authority to set investment policy and approve investment transactions is granted by the statutes governing the retirement system. That authority is generally vested in the board of trustees. However, since investment decisions tend to be complex, the authority to invest system funds may be delegated to the system director or to financial consultants with the necessary technical expertise. The nature of that delegation and the degree of control over investments which is retained by the board varies from system to system.

Three arrangements are common in teacher retirement systems. Large systems frequently create large in-house investment staffs which are then assisted by outside financial consultants. The Ohio State Teachers Retirement System uses such an arrangement and augments its 12-member investment staff with the services of a consulting investment firm.[1] In other systems, the board may take a more active role in the investment of the system assets, with board members serving on an investment committee. The Utah Investment Committee is composed of four board members plus the system director and oversees the four staff investment managers.[2] Finally, several states in our sample (TRS) placed investment authority in a central state investment council rather than the system board of trustees. The New Jersey State Investment Council, for example, handles the funds of all five statewide retirement systems including the Teacher's Pension and Annuity Fund. The Wisconsin Investment Board manages the assets of 23 different funds including those of both the local Milwaukee teachers' and state teachers plans.[3]

The degree of control retained by the board in the first two arrangements may range from defining strict investment policy guidelines

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[1]The State Teachers Retirement System of Ohio, *1977 Investment Report*, Columbus, Ohio, June 1977.

[2]Utah State Retirement Investment Fund, *1976 Annual Report*, Salt Lake City, Utah, 1976.

[3]Department of the Treasury of the State of New Jersey, *Twenty-sixth Annual Report*, State Investment Council, Trenton, New Jersey, 1976; Milwaukee Teachers Retirement Bureau, *Handbook of Information for MTRB Members*, Milwaukee, Wisconsin, December 1975; and National Education Association, *Teacher Retirement Systems*, 1976.

and careful review of investment transactions to formality approval. The influence of the board in the third arrangement is difficult to ascertain. The system director's role in investment decisionmaking is particularly difficult to ascertain from published information. In general, however, the interaction of retirement system boards, system director, investment councils, and outside financial advisors in the determination of investment policy and investment decisionmaking presents intriguing questions for further investigation.

Fiduciary Responsibility. The degree of discretion which an investment manager may have in the investment of retirement system funds is determined by the general fiduciary standards set forth by state statute. In its survey of the state laws regarding public retirement system investments, the Pension Task Force found that almost two-thirds of the states have no statutory fiduciary standards, a quarter of the states are governed by the "prudent man rule," and the remainder have standards which generally require investment practices which are in the "best interest" of the system.[1] The systems which are not governed by statutory standards are bound by common law fiduciary standards which are less stringent than the "prudent man rule." The "prudent man rule" requires an investment manager to exercise such skill and discretion as an ordinarily prudent man would use in the management of his own funds and is designed to limit investments in risky or unprofitable ventures. However, which investments are regarded as ""prudent" and which are not is a subjective decision and often must be applied on a case-by-case basis. In general, the use of the prudent man rule may tend to limit a retirement system's investment in "socially useful" but less profitable investments, such as the promotion of the local economy through the purchase of municipal bonds.

Communication and Disclosure

Since virtually all systems offer a variety of retirement and annuity options, another duty of the system's administration is to keep members

[1] *Pension Task Force Report*, 1978, pp. 446-471.

informed about benefits they might expect to receive and their rights under the plan provisions. All systems (PTF) provide new members with a plan description, either automatically or upon request. Changes in the plan provisions are also universally available, although the members are more likely to have to request such information. In contributory systems, the amount of accumulated contributions and the vested benefits become germane when an employee terminates. Retirement systems which include teachers (PTF) always provide an annual statement of an employee's accumulated contributions upon request; in about 75 percent of the plans that statement is furnished automatically. An estimate of a teacher's accrued retirement benefit is almost always provided by these systems, although usually upon request.[1]

Audits and Actuarial Valuations

All plans are legally required to conduct audits of the system's accounts. Although the frequency of the audits may vary, nearly 60 percent of all teacher systems are audited annually, either by a governmental agency or independent accounting firms. The remainder are audited regularly, but not annually.[2] It is interesting to note that approximately 75 percent of state systems are audited by a government agency while almost 90 percent of local systems employ an independent auditor.[3] This is probably because statewide plans have direct access to the state auditing services while local systems do not.

Actuarial valuations which assess the financial condition of a retirement system are also periodically required by law, but are generally conducted less frequently than system audits. About half of the state and local "teacher only" retirement plans are actuarially reviewed annually. The same proportion of state administered systems (including those plans that do not cover teachers) are reviewed at least every two years.[4] However, most of these valuations are conducted simply to calculate the annual employee contribution rate, rather than

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[1] *Pension Task Force Report*, 1978, Table 12.

[2] The data do not indicate how often these audits occur (*Pension Task Force Report*, 1978, Table 11).

[3] Ibid.

[4] Ibid., Table 53.

to undertake a thorough review of the system financial condition. For example, both the Hawaii Public Employee System and the Texas Teacher Retirement system conduct annual actuarial valuations, but only fully reexamine the system's financial condition every five years.[1] The Pension Task Force also found that approximately 12 percent of state teacher retirement systems are neither regularly reviewed nor conduct actuarial valuations more frequently than every five years.

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[1] Employees' Retirement System of the State of Hawaii, *Your Retirement System* (with legislative changes through 1977), Honolulu, Hawaii, 1973; Teacher Retirement System of Texas, *Annual Report*, Austin, Texas, 1976.

Appendix A

THE TEACHER RETIREMENT SYSTEM REPORTS

The table below presents a list of the data we received from the teacher retirement systems in response to the mail and telephone solicitations described in the Introduction. The information came in the form of benefit pamphlets, annual reports, and actuarial valuations. However, from some systems we also received copies of the state statutes, computer printouts or inter-office memoranda. The degree of detail and year of data vary considerably between systems. The table below does describe the year and type of information received. For the purposes of this sample, adequate administrative information was defined as administrative description that went beyond describing the composition of the system's board of trustees. Adequate financial information included contribution levels, assets, and the system's investment portfolio. Obviously, the most detailed financial data was contained in the actuarial reports we received. However, many systems included partial actuarial information, such as a balance sheet, in the annual report. Therefore, a system is deemed to have provided partial actuarial information if the annual report stated the system's unfunded accrued liability. Full actuarial information also included the actuarial assumptions and the funding method.

TEACHER RETIREMENT SYSTEM REPORTS

System	Date of Annual Report	Date of Benefit Data	Date of Administrative Data	Date of Financial Data	Date of Actuarial Report	Date of Full Actuarial Data	Date of Partial Actuarial Data
Alabama	1977	1977	none	1977	none		1976
Alaska	1977	1977	1977	1977	1977	1977	
Arizona	1977	1978	1977	1977	1977	1977	
Arkansas	1976	1977	none	1976	none		1976
California	1969-77	1977	1977	1969-77	none	1977	
Colorado	1978	1977	1975	1978	none	1977	
Denver, CO	1977	1976	1976	1977	1978	1978	
Connecticut	none	1976	none	none	none	none	none
Delaware	1977	none	1977	1977	none	none	none
Florida	1977	none	1977	1977	none		1977
Georgia	1976	1978	none	1976	none	none	none
Hawaii	1973-76	1977	none	1973-76	none		1976
Idaho	none	1976	none	1977	1977	1977	
Illinois	1977	1977	none	1977	none		1977
Chicago, IL	1977	1977	none	1977	1977	1977	
Indiana	1978	1977	none	1978	none		1978
Iowa	1977	1975 w/ updates	none	1977	1977	1977	
Des Moines, IA	1977	1975	1977	1977	none	none	none
Kansas	1977	1977	1976	1977	none	1977	
Kentucky	1976-77	none	none	1977	none		1976
Louisiana	none	1978	none	1978	1977	1977	
Maine	1977	1977	1977	1977	none	1977	
Maryland	1976	1977	none	1976	none		1976
Massachusetts	1976	1966	none	partial (1976)	none	none	none
Michigan	1976	1977	none	1976	none		1975

Appendix B

DISCUSSION OF ACCRUED BENEFIT FUNDING[1]

Unlike projected funding methods such as Entry Age Normal or Traditional Aggregate, Accrued Benefit funding does not base its cost calculation on the benefits employees are likely to earn during their careers. Instead, it calculates the normal or annual cost for each individual member based on the amount of pension benefits he *actually earned during that particular year.* Annual increments in benefits are earned on account of: (1) an additional service credit, (2) salary increases, and (3) benefit improvements. The sum of the individual costs for all the members equals the total normal cost for the system.

The accrued benefit funding method results in very steeply rising individual costs over time. Early in an employee's career, when his salary is low, the cost of benefits earned each year is also comparatively low. However, as the years of service increase and as an employee's salary increases, the benefits earned each year also increase, especially as the employee nears retirement age. Moreover, the nearer to retirement age, the lower is the discount factor applied to contributions in computing present value. Therefore, the accrued method shifts most of the benefit payments to the latter half of an employee's career. Further, given a growing labor force or continuous salary increases, the total benefit costs will continue to rise throughout the life of the system.

Accrued benefit funding is rarely used by large public retirement systems. In fact, we did not encounter any teacher systems that used this method. One reason is that public retirement systems tend to prefer funding methods which result in level contribution rates, as in Entry Age Normal funding. Also, the accrued benefit method is not applicable to systems which base their benefit formulas on final average salary, since that would require salary projections.[2]

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[1] "Accrued benefit" funding is also known as "unit credit" funding in older actuarial texts.

[2] Robert Tilove, *Public Employee Pension Funds*, Columbia University Press, New York, 1976, p. 150.

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U.S. General Accounting Office, *Funding of State and Local Government Pension Plans: A National Problem*, Washington, D.C., August 30, 1979.

U.S. House of Representatives, Committee on Education and Labor, *Pension Task Force Report on Public Employee Retirement Systems*, 95th Congress, 2nd Session, Washington, D.C., March 15, 1978.

TEACHER RETIREMENT SYSTEM REPORTS (cont'd)

System	Date of Annual Report	Date of Benefit Data	Date of Administrative Data	Date of Financial Data	Date of Actuarial Report	Date of Full Actuarial Data	Date of Partial Actuarial Data
Minnesota	1977	1978	partial (1977)	1977	none	1977	
Duluth, MN	1977	1977	none	1977	1977	1977	
Minneapolis, MN	1973-76	1976	1976	partial (1973-76)	none	1976	
Mississippi	1977	1977	none	1977	none	none	none
Missouri	1976	1975	1975	1976	none		1976
Montana	none	1977	1977	none	1977	1977	
Nebraska	none	1975	none	none	1977	1977	
Nevada	none	1977	1977	none	1976	1976	
New Hampshire	none	1975	1975	partial (1975)	1975	1975	
New Jersey	1975-76	1973	1976	1976	none		1975
New Mexico	1977	1977	1977	1977	none		1976
New York	1978	1978	1978	1978	none	none	none
North Carolina	none	1975	1975	none	none	none	none
North Dakota	none	1978	1978	1976	1975	1975	
Ohio	1977	1976-78	none	1977	none	none	none
Oklahoma	none	1978	1977	none	none	none	none
Oregon	none	1979	1977	none	none	none	none
Pennsylvania	1977	1977	none	1977	none	1977	
Rhode Island	1977	1977	none	1977	none	1977	
South Carolina	1977	none	none	1977	none	1977	
South Dakota	none	1977	1977	none	none	none	none
Tennessee	none	1977	none	none	none	none	none
Knoxville, TN	none	1977	none	none	none	none	none
Texas	1976	1977	1976	1976	none	1976	
Utah	1976	1977	1975	1976	none	none	none

TEACHER RETIREMENT SYSTEM REPORTS (cont'd)

System	Date of Annual Report	Date of Benefit Data	Date of Administrative Data	Date of Financial Data	Date of Actuarial Report	Date of Full Actuarial Data	Date of Partial Actuarial Data
Vermont	1977	1977	1977	1977	1975	1975	
Virginia	1975-77	no date	none	partial (1977)	none	none	none
Washington	none	1976	none	1976	1976	1976	
West Virginia	1977	1976	none	1977	none	none	none
Wisconsin	none	none	none	partial (1977)	none	none	none
Milwaukee, WI	none	1975	none	none	1977	1977	